Institution: University of Bedfordshire

Unit of Assessment: 25 – Education

Title of case study: Improving the quality of education through exploiting digital technologies

1. Summary of the impact.

This impact study, from the Learning Futures Centre (LFC), summarises 20 years' work by a team (Profs Leask & Preston, Drs Younie & Raiker) working with innovating educators in schools & businesses (Visiting Profs. Whalley (Elliott Foundation & Academies), Raffety (Academy for Innovation), Selinger (Cisco)) and the British Education Suppliers Association (BESA) staff (Savage, Barker), on applications of digital technologies to learning, teacher knowledge & practice, research practices & knowledge mobilisation. The team has a philosophical commitment to co-research with users & to translational research (Welcome, 2013). Highlights of impact include:

- **on practitioners and school-based pedagogy:**
  - Leask & Younie's (1995, 97, 99, 00, 01) EU funded research led to the founding of the European SchoolNet (EUN). 7% of EU teachers now engaged in the EUN & e-Twinning. Other projects led to DfE TeacherNet (approx. 2000-10), TDA Teacher Training Resource Bank (2003-10).
  - LFC staff initiated the main UK secondary teacher training text book series (1992-ongoing, '[text removed for publication]' sales) which links research to practice. Each includes ICT pedagogy.
  - Since 1992, MirandaNet (800 members, 80countries), founded by Preston, has linked educators, policy makers & companies in knowledge exchange & innovation.
  - Research findings & theories generated led to forming the Education Futures Collaboration (EFC) now funded by 19 national & international teacher education associations & universities. The EFC addresses OECD & UNESCO priorities through MESH the Mapping Educational Specialist knowHow initiative (www.MESHguides.org) supported by EdComms a LFC initiated worldwide collaboration platform for educators (www.educationcommunities.org) (1300+ members). MESH is the latest iteration of a programme of knowledge mobilisation & applied research using digital technologies.
- **on public policy & public services:** through collaborations, consultancies & contracts with policy makers & educational organisations in many countries e.g. with EU, the British Council, DFID, OECD, IEA, TDA, UNESCO, UK govt., Becta, CfBT, DfE, GTCE, SSAT, LAs, ICET, ATEA, TEFANZ, AAOU. EUN partners (33 ministries) meet annually to set EUN goals.
- **on educators more widely** via publications & invited conference keynotes (in early 2013 Aus., Finland, Pakistan, USA, Thailand).Theories generated about teacher knowledge & digital technology applications directly informed more than £20M investment initiated by Leask for the last UK govt. to create the Teacher Training Resource Bank (TTRB) (see data in Section 4).
- **the economy & business knowledge thinking:** through research for & with business, consultancy & running e-seminars at technology trade fairs for BESA as well as private seminars. Companies such as Toshiba, Oracle, Light Speed. Iris Connect, British Educational Suppliers Association, Sun Microsystems & other early IT companies have funded work.

2. Underpinning research. **Philosophy:** Articulation of the philosophy underpinning the Centre's work began in the 1990s. Staff EU & British Council funded research showed educators were working online in entirely new ways. Leask & Younie identified communal constructivism as a theory which explained the new phenomena. Communal constructivism '... encapsulates the ways in which ICT enables learners to collaboratively create knowledge' (Leask & Younie 2001:117). A Google search now gives over 90,000 references to this term. The research identified new models for teacher professional development through online professional networking which extended Vygotsky's (1986) socio-constructivism & Lave & Wenger's communities of practice (1991). The team foresaw that technology would bring whole system change in education, revolutionising & globalising the world of work. The resultant theoretical framework (communal constructivism) could be said to be predicated on the existential position of "Dasein", of being-in-the-world (Heidegger 1927). Virtual spaces provide the 'world' or community where individuals bring their 'beings'. Through exchanging their knowledge, their areas of 'troublesome' knowledge & their aspirations, each individual's learning becomes personalised whilst at the same time contributing to the community's knowledge. This concept of communal construction has been further researched by the team. Proctor (in press) & Raiker (2013) have researched methodologies arising from teachers

interacting concurrently in virtual & physical communal spaces. Carr & Kemmis (1986:221), in their work integrating Habermas' conceptions of communicative action with school teacher education, proposed that schoolteachers could "organize themselves as communities of enquirers, organizing their own enlightenment" or construction of new knowledge based on critical reflection, analysis & synthesis. This built on Stenhouse's (1975) concepts of networks of teacher-researchers undertaking action research which was then synthesised by researchers to generate new theories. The team has found that ICTs provide mechanisms which enable these processes. These theories underpin the team's new projects: EFC with MESH & EdComms. The MESH approach takes into the schools Carmichael's threshold concepts work & Carmichael & Procter's TLRP research.

The Team's Research provides impact through new theories & practical outputs in 5 linked areas:

Research Impact Areas (RIAs) relevant to practitioners, businesses & policy makers:

RIA 1 ways digital technologies *enhance pedagogy* across all phases (Burden, Leask & Younie (2nd edn in press), Leask & Pachler (3rd edn 2013), Outputs 1-6, Projects 1-9, 11-14.

RIA 2 design & deployment of ICTs to enhance *professional* learning (Outputs 1, 3, 4, 6).

RIA 3 design of digital tools & environments to enhance *student* learning. (Outputs 1, 6).

RIA 4 change management: system wide, barriers to adoption of new practices (Outputs 1, 5, 6).

RIA 5 knowledge mobilisation to facilitate research informed practice (Outputs 5, 6)

Examples of projects: the numbering is for ease of reference above & in Section 4.

P14 2010- ongoing: Education Futures Collaboration: Mapping Educational Specialist knowHow (MESH) & EdComms, 3rd sector sponsors £100K matched funding £300K+. RIAs 1-5.

P13 Staff continue their private consultancy & research RIAs 1-5.

P12 2011-2: *Digital Creativity & Digital literacy for HEI tutors* & seminar series. Partners: IT in Teacher Ed. Prof. assoc... Leask, Jones, Younie. HEA/Jisc & ITTE. £28K. RIA 2, 5.

P11 2009-00: *ICT…Futures*: Leask &Younie, Preston, Raiker. BECTA, £40K. RIAs 1-5.

P10 2006-8: ITTE: '*Voices' Project* (£4,500) Younie with others. Funder: ITTE RIAs 1, 5

P9 2001-3: '*Classrooms of the Future'*: Project PI Younie DFES & Sci. Museum. RIAs 1, 3, 4

P8 2001-3: 'Schoolscape@Future*'*: 'Identifying examples of innovative ICT practice to build networked knowledge between teachers, researchers & industry'. PI Younie. Funder: EU 293,151 Euros. Socrates Programme (89762-CP-1-2000-1PT-Minvera-ODL) RIAs 1,3,4

P7 2000-2: EU '*Web @ Classroom'*: PI Younie. Funder: EU 480,770 Euros. Socrates Programme. International Innovation Award: 'ICT Best Practice in Eu. Edu.' RIAs 1, 3, 4

P6 2000-1: Leask secondment to NFER: to work on international ICT research projects e.g. 2000-1 OECD UK Team Leader: *ICT & Whole School Improvement.* Approx £200K; DFID, PI, *Using ICT…in Zambia.* Approx. £180K. Consultancy followed indicating the value of research e.g. TeacherNet £25K DfES, TTA Eval. of NOF approx £20K. RIAs 1-5.

P5 1999-00: *EUN European Knowledge Centre*: PI Leask RA Younie MM1010 funded. RIA 2

P4 1997-00: EUN *The Learning School*: PI Leask, RA Younie. Partners all EU govts, academics /civil servants. WP 14 Eu SchoolNet Multi Media Project: Funder: EU. 3M Ecus, UK share 500K Ecus Socrates Prog. (MM1010) & 23 Education Ministries. RIAs 1,3,4,5

P3 1998-00: Phase 1 *TeacherNetUK*: *teachers' CPD through the internet.* PI: Leask & Preston (MirandaNet), Leafe (DfE & PhD student), Pachler (now IoE but still co-author). Partners: thought leaders, univ., telecomms companies, civil servants, other academics, Ultralab, SSAT, LAs, Funders: all partners: cash & in kind approx £500K. RIAs 1,2,3

P2 1995-6: *New Images Montage*: *models for international collaborative internet projects.* PI: Leask. Partners: Qld State Govt., British Council. Funder: British Council £10K. RIAs 1-3.

P1 1993-6: *Evaluation of Project Connect*: *the value of internet connection to schools*. PI: Leask. Partners: univ., telecoms companies & an entrepreneur. Co-funded. RIAs 1-4

Core Centre Staff employment: Team collaboration has continued regardless of staff location. Dr Raiker MA student 95-7, DMU/UoB 99–now; Prof. Leask DMU 1990-2002 (seconded NFER 2000-1); TDA 2002-6 & IDeA/LGA 2006-8; Brunel 2008-10, UoB 2010–now; Prof. Carmichael 2012 –now; Procter (PhD student) 2010–now. Dr Younie FT1995-2006 & Prof. Preston consultant 1994-2000 both 0.2 FTE from 2011. Visiting Profs Whalley, Raffety, Selinger, SRF Jones (business).

3. References to the research. Research quality of included outputs is benchmarked against REF criteria & evidenced through the methodologies in outputs. User value is demonstrated by repeat contracts, grants & consultancy, requests for key notes for example:

International & national invitations consultancies, lecture tours, external examining (UK, Australia, Pakistan), keynote conference speeches (Thailand, China, various South American

countries, NZ, Australia, US, UK, EU Teacher Ed & Policy network, Asian Association of Open Universities, Pakistan), expert panels (OECD e.g. pedagogy & neuroscience, EU & UNESCO e.g. digital technologies), research collaborations from ministries, professional networks, (Aus., NZ & UK national teacher associations, academics, local authorities, companies, & invited workshops).

Positions held through election by peers on national committees e.g. UNESCO/IFIT publication committee: judging panel British Education Suppliers Association (BESA), peer election to professional bodies, e.g. UCET exec (Leask), chair of ITTE (Younie). **Awards** e.g. Leask's online communities of practice for local govt. received two national awards for ICT innovation & excellence. Younie's 'Web @ Classroom' project won an EU International Innovation Award. Preston has won many awards for her ICT work e.g. NAACE Global Educator Award (2013), Digital Inclusion Associateship, Univ. of Jujuy, Argentina (2011), Trnkova Medal Czech Technical Univ. (2002 Prague), World Academic Council Humanitarian Award (2000 Paris), European Union of Women of Humanitarian Achievement Award (1998 London).

Invitations to take part in expert panels e.g. UNESCO, OECD, EU on digital technology developments, BESA panels assessing digital products awards, Leask 2008 REF panel.
Collaborations from companies & academics worldwide e.g. sponsored conferences e.g. 2012 Digital Technologies: from grassroots research to policy making with DfE, business & academia.
High usage levels of web resources see sections 4 & 5.
Repeated project contracts e.g. with Brit. Council, SSAT, TDA, DfE, BECTA, EU, ITTE, business
Invitations to join editorial boards: E learning, Reflective Learning, Jorsen, TPE, Computer Edu.
Book Sales since 1994 200,000+, continuing sales, institutional adoption shows user value.
Two national agencies (TDA & LGA IDeA) appointed Leask to positions where she implemented theories from the team's research to bring about system change. (£20M budget).

Key outputs reporting the research include the following.
O1 Younie, S. & Leask, M. (2013) *Teaching with Technologies*. Maidenhead: Open Univ. Press. Text book for practitioners & policy makers. Summarising 25 years of authors' research.
O2 Leask, M. & Younie, S. (2013) National models for CPD: the challenges of 21st C knowledge management, *Professional Development in Education*, 39 (2), 273-287.
O3 Cuthell, J. & Preston C. (2012) *Tracking the stages of learning: concept maps as representations of liminal space.* In: Studying the Educational Web 2.0. Themes in Science & Technology Ed. Journal 5 (1/2), for educators.
O4 Preston, C. & J. Cuthell (2011) *MirandaMods: from practice to praxis in informal professional learning contexts* Research on e-learning & ICT in Education: Tech., Pedagogical & Instructional Issues. Springer, for educators.
O5 Leask, M. (2011) Improving the Professional Knowledge Base for Education: using KM & Web 2.0 tools, *Policy Futures in Education*, 9(5), 644-660, for policy makers, edu. leaders
O6 Leask, M. & Preston, C. (2010) *ICT Tools for Future Teachers*: Becta, companies & policy.

4. Details of the impact. High sales of texts, repeat consultancies & contracts from the same funders, membership levels of LFC initiated networks & usage levels of web resources provide proxy measures of relevance & impact on potential research users (details below). Global impact & reach is supported through the 3 e-tools the Centre has developed: MESH www.MESHguides.org an innovative translational research publishing tool, EdComms www.educationcommunities.org an online collaboration tool & MirandaNet www.mirandanet.ac.uk web resources & e-network. All are funded by partner universities, companies, teacher ed. associations nationally/ internationally.
Testimonials are available. One partner company says the impact of bringing industry & educators together through the networks & seminars is that "*it has given (us) the opportunity to practically demonstrate to many involved in education, the impact our systems have - on performance of students ...*" Public resources & services developed based on the centre's research include DfE TeacherNet (P3), European SchoolNet (P4), TDA online resources (P5, O1), the LGA/IDeA online communities (O8), & now, in the latest project, the Education Futures Collaboration (O2,6, P14) many have been tested with MirandaNet fellows initially & during development. The findings of one project provide the foundation for the next. For example, in 1995 Leask found the use of the Internet in education in Australia was in advance of UK practice. Checks with ministers, civil servants & HMI found that nothing similar was planned in the UK. The univ. then hosted regular meetings including civil servants, business, academics, & teachers to conceptualise what became the DfE TeacherNet. From this came a university collaboration with the Swedish Ministry to develop the European SchoolNet (EUN) supported in 1995 by all EU ministries of education except

for the UK. Leask with company partners met David Blunkett, Shadow Education minister. He asked the univ. to be the UK representative until Labour was elected (1997). The EUN continues today (www.eun.org) & is expanding, supported by all EU education ministries. The associated E-Twinning project involves 7%, i.e. hundreds of thousands of EU teachers. In the European Knowledge Centre project, a spin-off of the EUN, the UK work undertaken by Leask underpinned DFE, TDA, LGA & GTCE web development that she was contracted to do. The learning from the LGA & TDA projects (O1, 2, 4, 6) provides underpinning theories for EFC, MESH & EdComms.

Reach: Professional practice in schools & local authorities: In the early 1990s a decision was made by govt. to shift teacher training into schools. Univ. teacher training staff who had been school teachers were aware of the difficulties of accessing new knowledge in schools & made the decision to write a text book to make research-based knowledge accessible to practitioners. The core text (6th edn 2013) & accompanying specialist texts have sold '[text removed for publication]'. Research outcomes of projects (P1-13) are included. Our research results in requests for staff to undertake research, develop courses & provide consultancy e.g. from P12 Younie & Jones have been inundated with international requests for training. Raiker reached 6,000 teachers through NOF.

Reach: Public policy influence: Leask, Preston, Younie have been invited to join specialist panels (UNESCO, EU, OECD, TDA) developing ICT policy & on ministerial sounding boards. Younie for example in her role as chair of the professional association ITTE has been closely involved in policy advice on curricula & resources & standards. The team's research influenced, through contracted work the TDA, IDeA, GTCE & others in developing the use of the web to support professional development, knowledge exchange & creation. Keynote speeches were invited in 2013 alone to many networking events e.g. UK, US, Asian, Australasian, EU networks.

Reach: Public services: From 1995-2010 the team advised DfE, TDA, GTCE on web developments. Evidence of reach includes web stats e.g. TDA TTRB data 124,800+ page views a month, 32,400 visits/month, 37% Students/Trainees, 21% Tutors, 22% Teachers (TDA 2010). The LGA's online communities of practice (2008 ongoing) was launched by Leask & won two awards: e-Government National Award (Winner, 2008) and the GC Awards (Winner, 2009). 150,000 users, 1,300 communities in 2013. MirandaNet links 800+ members in many countries: business, policy makers, practitioners & academics. EdComms links 1300+ practitioners, business & policy makers.

Reach: The economy & business knowledge & thinking: Preston & Leask have undertaken confidential research for the British Council into international markets for ICT & education companies. They have been invited to address the British Council annual delegations of civil servants & ministers at the world's largest annual digital technologies in education exhibition in London (BETT). Preston at the request of Brit. Edu. Suppliers Association annually runs MirandaNet educational seminars: in 2013, Sir Bob Geldorf led debate. Text book series initiated by staff provide a multi-million pound turnover for UK publishers. Reciprocal relationships with companies have continued from the 1990s: they commission research & sponsor events.

Support for impact from unit & institution 2008-13. UoB supports the Centre through an annual research conference, staffing, paid conference attendance & events, staff PhDs/EdDs, & founder membership of P14 EdComms (£40K). Since P1 (1993) the univ. has supported impact & innovation through sponsored PhDs, Profs & RAs. Publications are free from international interactive online/face-to-face events (O3, 4) & have attracted 800 researchers, teachers & policy makers & MESH translational research publications which bridge the research/ practice divide. UoB's support for the current MESH/EdComms work (O1, P14) provides an international e-infrastructure supporting knowledge mobilisation (O2) (1,300 members, many countries).

5. Sources to corroborate the impact a) web statistics: for network membership, organisations & countries of origin, contributions, for MirandaNet; Ed. Comms, MESH Guides, EFC TeacherNet & Teacher Training Resource Bank archived) b) user & sales data for texts linking theory & practice.

Area of impact	Dates	role of person & organisation
Society & quality of life	*2010 ongoing*	*retrd. London Schools Commissioner*
Society & quality of life	*1998 ongoing*	*Senior Managers, European Schoolnet*
Public policy & public services	*1995 ongoing*	*Director responsible DfE TeacherNet to 2011*
Business knowledge & economy	*1990 ongoing*	*Director, British Ed. Suppliers Assoc.*
Business knowledge & economy	*1990 ongoing*	*Editorial Director, Routledge/TaylorFrancis*