*This is an Accepted Manuscript of an article published by Taylor & Francis in Journal of Education for Teaching on 17 June 2013, available online: **http://www.tandfonline.com/** 10.1080/02607476.2013.801216*

RESEARCH IN PROGRESS

TRANSLATIONAL RESEARCH PRINCIPLES APPLIED TO EDUCATION: THE MAPPING EDUCATIONAL SPECIALIST KNOWHOW (MESH) INITIATIVE.

Kevin Burden[a], Sarah Younie[b], Marilyn Leask[c*]

(on behalf of the members of the Education Futures Collaboration):

[a] *University of Hull,* [b] *De Montfort University,* [c] *University of Bedfordshire*

*Corresponding author. Email: marilyn.leask@beds.ac.uk

*This is an Accepted Manuscript of an article published by Taylor & Francis in Journal of Education for Teaching on 17 June 2013, available online: **http://www.tandfonline.com/** 10.1080/02607476.2013.801216*

WHAT IS MESH?

MESH is a part of a research project applying knowledge management principles which are well known in other sectors, public and private, to the education sector (Leask, 2011, 2012; Leask and Younie 2013, Leask and Preston 2012). The goal is to develop and test out the new ways of working now possible with digital technologies which can address long standing improvement challenges faced by education sectors in all countries.

MESH is an initiative involving educators worldwide in building a quality assured wikipedia of professional knowledge for teaching. MESH is a translational research project initiated by the Education Futures Collaboration (see http://www.edfuturescollaboration.org). MESH Guides are quality assured and tested with teachers and provide advice linked to research and evidence. For some emerging examples see http://www.meshguides.org/themap/index.html When fully developed MESH will use digital technologies and an innovative knowledge mapping approach to provide personalised, research based advice and 'just in time' learning to support teachers in extending and deepening their professional knowledge.

The research behind MESH has involved several phases over many years. Phase 1 involved testing the theory with teachers and trainee teachers in a range of subject areas; Phase 2 developed a prototype and tested the ideas further with teachers, student teachers and newly qualified teachers; Phase 3 tested the ideas with international colleagues; Phase 4, the current phase, consists of establishing editorial boards and quality assurance processes whilst

broadening the range of areas covered and testing for impact; Phase 5 will represent the launch of the first fifty pathways.

Why MESH?

Keeping teachers up to date with the latest research on effective teaching and learning is a task no country can afford using traditional forms of training (UNESCO 2003, 2007; Bubb and Earley 2006). Neither can initial teacher training provide teachers with all the knowledge they need to be effective in a career which may span forty or fifty years.

The Organisation for Economic Cooperation and Development (OECD, 2009, p.3) calls for the "creation of 'knowledge-rich', evidence-based education systems," because:

> in many countries, education is still far from being a knowledge industry in the sense that its own practices are not yet being transformed by knowledge about the efficacy of those practices.

The reasons for this lack of access to, and organisation of, knowledge are various. An international group of teacher educators has come together to create new ways of working which address this challenge. We are introducing the notion of translational research into our education systems and demonstrating how digital technologies can be used to support the development and dissemination of research-based practice and provide cost effective CPD through sharing, building and testing practice through interconnected sustainable online communities (see www.educationcommunites.org). The Education Communities

environment has over 1100 members worldwide and is growing rapidly with subject specific groups forming to work collaboratively on a whole range of educational challenges.

Translational research is well established as a concept in medicine, but not in the school-based education sector. Translational research provides a bridge between researchers and practitioners. A new form of publishing has been adopted in the form of knowledge maps (called MESH Guides) which translate the findings of educational research into practical outcomes. Early examples can be seen at www.MESHGuides.org with more sophisticated software being developed similar to the successful Map of Medicine Healthguides created by doctors to train new doctors (see http://healthguides.mapofmedicine.com/choices/map/index.html).

MESH Guides contribute to addressing the issue that no country can afford the costs of providing CPD out of school for teachers. This challenge of continually updating teachers is one which has not yet been resolved. MESH also addresses the issue of the plethora of small scale insignificant research in the education sector by providing an e-infrastructure for groups to come together so as to scale up promising small scale research. Many of those involved in starting MESH were involved in work commissioned by the Training and Development Agency (TDA) in England, to place the knowledge base underpinning teacher training on the web. This involved reviewing the evidence base in many areas through the issuing of contracts for systematic reviews. For one area, primary modern foreign language pedagogy, over 5000 studies were found worldwide, but it was not possible to synthesise these to get any sense of what was known in the field. For example, the Campbell Collaboration (see http://www.campbellcollaboration.org) was set up internationally to

synthesise education research and has not been able to have significant impact, unlike the medical equivalent the Cochrane Collaboration (see www.cochrane.org).

MESH aims to support

- improvement in the quality of teaching through providing educators and learners with access to advice based on research focused on improving student outcomes.
- focusing of research effort and research funding on gaps in research through making the strength of evidence for advice to practitioners explicit.

MESH - A NEW FORM OF PUBLISHING

MESH uses online graphical flowcharts/mind maps or pathways (MESH Guides) to present complex knowledge. Each node links a summary to the underpinning research and evidence which may include text, audio or video.

HOW DOES MESH OPERATE?

MESH operates in a similar way to that used for the production of edited books or academic journals. But MESH Guides are regularly reviewed, added to and thus continually improved as evidence builds.

MESH is currently focusing specifically, but not exclusively, on the following areas of teacher professional knowledge identified by Shulman (1986, 1987):

- **General Pedagogic Knowledge,** i.e. the broad principles and strategies of classroom management and organisation that apply irrespective of the subject.
- **Pedagogical Content Knowledge,** i.e. the knowledge of what makes for effective teaching and deep learning of subject specific concepts. This includes specifically, the effective teaching of threshold or troublesome concepts.
- **Knowledge of learners and their characteristics,** i.e. knowledge of learners of a particular age range and knowledge of cognition. This includes how to adapt pedagogy to specific special needs.

The intention is over time, to make use of sophisticated software to facilitate the interconnection of the content in MESH Guides linking, for example, research about cognition with challenges in learning of specific concepts in specific subject areas.

MESH is supported by an e-infrastructure (see www.educationcommunities.org) , which was the focus of an earlier knowledge management research project and which is designed to connect isolated initiatives and create national and international development capacity, allowing for knowledge exchange and co-creation between educators, teacher educators, policy-makers and academics nationally and internationally. RaDaR Groups, Research and Development and Review Groups are encouraged as a means for connecting up researchers and research users with similar interests.

A current example would be the RaDaR group Kevin Burden recently set up and runs with the objective of identifying and developing distinctive pedagogies and the research basis supported by tablet technologies like the iPad. The emergence of highly mobile and powerful computing devices, such as the iPad, promise significant educational benefits for students and teachers alike, but the research base for this set of emerging technologies is relatively slight. The iPad technologies RaDaR group was formed to capture the emerging research base in this field in ways teachers and other practitioners can use and feed back into. It consists of a core group of researchers and practitioners located around the globe, using virtual technologies such as the Education Communities Groups, to harvest and collect intelligence and understanding about the use and impact of mobile technologies like the iPad in education. It has established a distinctive template for collecting and validating this emerging evidence base which consists of (1) the evidence base including the sample size and methodologies used; (2) identified challenges to adoption which users need to be aware of in relation to the evidence base; (3) contextual factors which may impact on the effectiveness of these technologies across various settings; (4) particular interventions or distinctive pedagogies which have been identified for the use of tablet technologies; and (5) case studies of success which will build and expand as a more substantial research base for these technologies emerges. In this way it is anticipated the evidence base for the use of these technologies will be more widely available to other researchers and practitioners, enabling end-users (i.e. teachers) to make evidence-informed judgements about whether, and how, to implement mobile technologies like the iPad. Their judgements will thus be based on research which is validated by, and available to, a wider community of users than is traditionally the case with published academic research. This way of working supports the cost effective scaling up of small scale research.

*This is an Accepted Manuscript of an article published by Taylor & Francis in Journal of Education for Teaching on 17 June 2013, available online: **http://www.tandfonline.com/** 10.1080/02607476.2013.801216*

Those wishing to keep in touch, or be engaged more directly with this research, are invited to register on the Education Futures Collaboration community http://www.educationcommunities.org/c/120856/home.do and set the email alerts to 'on' so as to receive updates.

ACKNOWLEDGEMENTS

The Education Futures Collaboration include:

- Linda Devlin, and colleagues, University of Wolverhampton, UK
- Professor Alex Kendall, Professor Martin Flautley and colleagues, Birmingham City University, UK
- Sarah Jones and Richard Millwood Core-Education, UK
- Dr Mo Glackin and colleagues, St Mary's University College, UK
- Professor Linda la Velle and colleagues, Plymouth University, UK
- Professor Christina Preston and colleagues (Mirandanet via www.mirandanet.ac.uk)
- Professor Rosie Rafferty, Interface Space, UK (see www.interfacespace.com)

The work of the hundreds of colleagues involved in developing MESH is also acknowledged (see www.MESHguides.org where the list of authors who have developed MESH Guides is updated regularly).

REFERENCES

Bubb, S. and Earley, P. (2006) Induction rites and wrongs: the 'educational vandalism' of new teachers' professional development, *Journal of In-service Education*. Vol. 32, No. 1, March 2006, pp. 5–12 ISSN 1367–4587 (print)/ISSN 1747–5082 (online)/06/010005–08. DOI: 10.1080/13674580500479844

Leask, M. & Younie, S. (2013): National models for continuing professional development: the challenges of twenty-first-century knowledge management, *Professional Development in Education*, DOI:10.1080/19415257.2012.749801.

Leask, M., (2011) Improving the Professional Knowledge Base for Education: using knowledge management and Web 2.0 tools, *Policy Futures in Education*, 9(5), 644-660. Audience: policy makers, educational leaders.

Leask, M. (2012) Research Impact and Dissemination in a Connected world, in Arthur, J., Waring, M., Coe, R. and Hedges, L. (2012) *Research Methods and Methodologies in Education.* London: Sage

Leask, M. and Preston, C. (2010) *ICT Tools for Future Teachers*: Research Report for Becta: Coventry, UK.

Shulman, L. (1987) 'Knowledge and teaching: Foundation of a new reform', *Harvard Review*, 57: 1-22.

Shulman, L. (1986) 'Those who understand: Knowledge growth in teaching', *Educational Researcher*, 15: 4-14.

UNESCO (2003), Teacher Professional Development, An international review of the literature. UNESCO International Institute for Educational Planning
Accessed 24 April 2013 http://unesdoc.unesco.org/images/0013/001330/133010e.pdf

UNESCO (2007) Teacher Education Policy Forum for Sub-Saharan Africa Report. UNESCO, Paris.
Accessed 24 April 2013 http://unesdoc.unesco.org/images/0016/001627/162798e.pdf