Title:
Participatory Knowledge Mobilization: An emerging model for international translational research in Education.

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Abstract:
Research alone does not inform practice, rather a process of knowledge translation is required to enable research findings to become meaningful for practitioners in their contextual settings. However, the translational process needs to be an iterative cycle so that the practice itself can be reflected upon and thereby inform the ongoing research agenda. This paper presents the initial findings of a study into an international, participatory model of knowledge mobilization in the context of translational research in the field of education. Using a mixed methods approach, the study draws upon data collected from the Education Futures Collaboration (EFC), an educational charity, which has developed an international knowledge mobilization strategy. Through the innovative use of technologies this initiative improves the link between research and practice by finding new and practical ways to improve the knowledge base for practitioners. The EFC has developed two work strands within the international knowledge mobilization strategy, which utilise two complementary digital platforms. The first is the online MESHGuides (**M**apping **E**ducational **S**pecialist know**H**ow), a collaborative tool for connecting educators with visual summaries of educational research from which practice can be developed. The second is the online Education Communities of Practice network, which is used to support international partnerships for collaboration between researchers and practitioners. Findings indicate that utilising web 2.0 tools to develop translational research through MESHGuides is significantly groundbreaking in its vision and scope with respect to practitioners accessing and building the knowledge base of the teaching profession internationally and strengthening the link between researchers and practitioners, thereby increasing the impact of research in education.

Key Words: translational research, international knowledge mobilization, knowledge management, map of education, digital technologies, web 2.0 tools

1. Introduction

Improving education systems across the world is an elusive goal. Although such a goal is an UNESCO priority (2014), government policies in many countries, often focus on the structures of schooling rather than the more complex issues of learning and teaching. An Organisation for Economic Cooperation and Development (OECD) report has highlighted that it is more difficult and far harder to "reshape the core activities and dynamics of learning in the classroom..." (2010, 26), than to change the "surface structures and institutional parameters" of schools. Bereiter (2002) has called this disengagement from problems of teaching and instruction, when considering school reforms, a "fundamental malady" (2002, 394). Indeed existing models for system improvement assume that educators and teacher educators already have easy access to a high-quality professional knowledge base and know

what to do with it when they get it. Professional knowledge, which provides the foundations of practice, is unproblematized and appears to be treated as a 'magic ingredient', which does not require discussion, systematic management, renewal, coordination, resources or support. The OECD argues that,

> 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…. (OECD 2009, 3).

The OECD identifies this international challenge facing education as the need to create "knowledge rich, evidence based education systems" (2009, 3), making relevant research on transformative learning and teaching accessible. International studies such as the Teaching and Learning International Survey (TALIS) run by the OECD and a McKinsey Report (Barber and Mourshed, 2007), indicate that improving the quality of our educators is more important than increased financial investment. Both reports challenge governments, academics and practitioners to adopt new ways of building and sharing knowledge. However, despite the considerable investment noted in both reports, many countries are still struggling to develop and make accessible the professional knowledge base required to underpin professional practice. Every day, teachers and lecturers around the world make decisions about how to help learners and need easy to access and up to date evidence to inform those decisions, because as Barber and Mourshed pointedly state, "the quality of an education system cannot exceed the quality of its teachers" (2007, 19).

The quality of the professional knowledge base, which educators draw upon is rarely discussed and neither are the training needs and qualifications of teacher educators. Stenhouse argued that "research and development ought to belong to the teacher" (1975, 142) but adds that there are some inherent difficulties with this as "the teacher's professional self-image and conditions of work will have to change" (ibid) so that they view their classrooms as laboratories and see themselves as being a part of a "scientific community" where they can critically test out ideas rather than accept the current practice. Stenhouse argued that,

> Each classroom should not be an island…teachers working to such a tradition should communicate with one another…they should report their work…a common vocabulary of concepts and a syntax of theory need to be developed…If teachers report their own work in such a tradition, case studies will accumulate, just as they do in medicine. Professional research workers will have to master this material and scrutinize it for general trends. It is out of this synthetic task that general propositional theory can be developed. (Stenhouse 1975, 157)

Whilst this vision was articulated 40 years ago, we are still far from realising this knowledge management based approach in education. Critically, we must ask, where are we with Stenhouse's synthesis challenge? It would appear that, in countries such as the UK there continues to be a copious generation of educational case studies and very little systematic collation. Without syntheses, the profession is potentially

overrun with research studies (Davies 2003), which raises a critical issue of knowledge management in the field of education.

To realise Stenhouse's (1975) vision of 'synthesis' we need to mobilize knowledge through the development of new processes which enable cost effective methods for scaling up small scale research, which can then be made accessible and collaborative, informing both academics and teacher practitioners and which enable rapid evidence based responses to government policy makers. Teachers need to become critical consumers of research. Indeed the BERA-RSA Inquiry into Research and Teacher Education (2014) found that "the evidence gathered by the Inquiry is clear about the positive impact that a research literate and research engaged profession is likely to have on learner outcomes" (BERA-RSA 2014, 6). This paper seeks to critically assess where we are with Stenhouse's synthesis challenge and puts forward an emerging model of international knowledge mobilization, which is being developed by a UK registered charity, the EFC is international in reach and is showing early signs of impact in educational translational research (Harrison *et al.,* in press).

2. Linking Research, Evidence and Practice

Davies (2003) argues that the volume of potential research evidence in most substantive areas of social science and public policy, coupled with the rapid growth of access to knowledge as a result of information technology, make it almost impossible to keep abreast of the research literature in any one area. Like Barnett's (1998) concept of super complexity, there is a surfeit of data, making it no longer possible to know everything in one's field. However, outside of education, other professions such as medicine, have made successful inroads to make research accessible to practitioners, as will be discussed during this section.

2.1 Systematic Reviews

One of the most successful approaches in supplying evidence-informed practice in the medical field has been the use of systematic reviews. Systematic reviews can be described as a,

> "synthesis [of] the findings of many different research studies in a way which is explicit, transparent, replicable, accountable, and (potentially) updatable". (Oakley 2003, 21)

These were initially championed in the medical field by the Cochrane Collaboration (Sheldon & Chalmers 1994), which was initiated during the late 1970s and early 1980s by a group of health service researchers in Oxford, who prepared the ground for evidence-based medicine by beginning a programme of systematic reviews on the effectiveness of healthcare interventions. The Cochrane Collaboration[1] is now an international network of researchers, academics, practitioners and users committed

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[1] http://www.cochrane.org

to the principles of managing knowledge in such a way that it is quality assured, accessible and cumulative (Oakley 2003, 21).

Systematic reviews conducted by the Cochrane Collaboration are mostly focused on the use of randomised experimental studies as the favoured research methodology. These are regarded by many as the 'gold standard' of research (Torgerson and Torgerson 2008, 1). Many studies of this type are able to be reviewed in a systematic and replicable way to produce a review of the evidence for that topic. As Gough argues "randomised control trials are often seen as the strongest design to establish efficacy" although "quasi-experimental designs or non-controlled studies" (2004, 55) may also contain useful evidence. Notably these reviews are different from those more common in education, where narrative literature reviews focus on the range and diversity of research, typically using a selective, opportunistic and discursive approach to interpreting research literature (Badger *et al*. 2000; Davies 2000), which Oakley argues can result in both biased and misleading findings (Oakley 2003).

The Cochrane methodology to develop systematic reviews is being adapted by the Campbell Collaboration, a sibling organisation to Cochrane, with the aim of disseminating systematic reviews in the areas of education, crime and justice, and social welfare. In the UK, the Evidence for Policy and Practice Information (EPPI) and Coordinating Centre (at the Social Science Research Unit at the Institute of Education, UCL) was funded by the Department for Education and Skills (DfES) and Teacher Development Agency (TDA) for five years, from 2000 to carry out systematic reviews in the UK on educational research (Oakley 2003). Another initiative aimed at the development of a systematic knowledge base is CEBE (Coalition for Evidence-Based Education). Based in York, CEBE provides an example of good practice in translational research. Set up in 2009, it points to initiatives which provide aspects of translational research services, such as the CERUK[2] a database of research (which is no longer being updated) and the Educational Evidence Based Portal (EEP), which similarly hosts a database of academic papers and education articles.

Although systematic review methodologies have been robustly developed there has been a number of criticisms levelled against them from Hammersley (2001a, 2001b), and Elliot 2001. Hammersley is concerned that systematic review methods could be adapted to "favour some kinds of research against others" (2001a, 546). This is what he refers to as a positivist model of research, and for him there is a chance of "valuable evidence being overlooked here and/or misleading evidence being privileged" (2001a, 546). Thus for Hammersley, a methodology privileging quantitative research and the dismissing of qualitative research means that much valuable evidence is being overlooked. Additionally, Hammersley also argues that a positivist model is adopted in the task of producing reviews, which implies that this is the "...only or best way of representing the literature, either for other researchers or for external 'users'" (2001a, 546). Hammersley is rightly concerned that "this instrumental view of the role of educational research may undermine effective practice, because it privileges research evidence over evidence from other sources, including that arising from the experience of practitioners" (2001a, 546).

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[2] http://www.ceruk.ac.uk/

4

Also, Hammersley (2001a) provides political insight when he argues that "...advocacy of systematic reviews, and of evidence-based practice, are closely associated with moves towards increased central control over educational research" (2001a, 550). Elliot (2001) is in agreement and argues that research synthesis will control professional practice. Similarly, an important criticism is that evidence-based practice may lead to a 'what works' agenda against which professionals may be judged or inspected. Arguably this model of 'what works' may not take into account the specific context and nature of the dynamic situations that call for practitioners' professional judgements to be used and is argued against by Biesta (2007, 2010).

2.2 Translational Research

According to Wethington and Dunifon (2012), translational research can be described as a systematic approach to turn research knowledge into practical applications. However, to date, such research has most widely been associated with the field of science, particularly medicine and has yet to be made a reality in education. An example of this approach can be seen in the Map of Medicine[3].

The Map of Medicine is a freely available resource, which can be accessed on multiple levels to inform a variety of people about illness and treatment options. It is used by doctors and other health professionals across the UK NHS to select the best treatment options for their patients. However, it can also be accessed by patients, carers and other members of the public to inform them on a wide range of medical conditions. The Map of Medicine aims to "improve the quality of care, operational efficiency and financial performance of health organisations everywhere" (http://www.mapofmedicine.com/thechallenge/thechallenge/) through better decision making, which will enable better care of patients.

2.3 Online Networks and Communities of Practice

To create, develop and make use of translational research and systematic reviews a flexible e-infrastructure connecting people and communities is needed. Examples of where such networks and communities already exist can be found in initiatives such as the Knowledge Hub[4], which was set up for practitioners in UK local government to exchange knowledge around effective practice so they might improve public services and produce social value (Leask 2011). As the UK's largest platform for public service collaboration, the Knowledge Hub enables members to freely connect, supporting their use of communities so that they can share knowledge and expertise and develop initiatives in a secure environment. There has also been other similar online networks created in the medical context, such as the National Institute for Clinical and Health Excellence (NICE) Communities as well as some in education, such as the Talking Heads (National College) initiative (Jones *et al.* 2001).

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[3] http://healthguides.mapofmedicine.com/choices/map/index.html

[4] https://knowledgehub.local.gov.uk/

3. The Development of a Knowledge Mobilization Framework for Educators

The pockets of good practice in systematic reviews, translational research, online communities and networks in the field of education discussed in section 2, have often been disjointed and unconnected. Moreover, Leask and Younie (2013) argue that research into fine-grained areas of practice that teachers want to know about, are hard to find or, are missing altogether. One example would be research into the barriers that prevent the understanding of threshold concepts in specific subject areas like, for example, maths and science. In addition, the examples discussed in section 2 are by and large, static in that they present findings at a point in time and do not provide opportunities to scaffold relationships for collaboration or provide feedback loops between stakeholders, such as researchers, practitioners and policy makers. Knowledge mobilisation is about reducing the gap between research and practice and simultaneously strengthening the link between research and practice. Levin uses the term knowledge mobilisation (KMb) "to refer to efforts to understand and strengthen the relationship between research and practice" (2013,2). Although many other terms such as 'dissemination', 'knowledge exchange', and 'knowledge translation' have been used, Levin argues the term knowledge mobilisation is more appropriate, "because it indicates that this work requires specific effort, over time, working with others, and involves much more than telling people about research findings" (ibid.).

For Levin (2013) knowledge mobilisation is a collaborative endeavour. Furthermore "mobilization' captures the interactive, social and gradual nature of the connection between research and practice and makes it clear that this is not a one-way process" (2013, 2), instead it is a dynamic, iterative process. Thus for Levin, knowledge mobilisation is a cooperative, social task, that requires a specific effort and cannot be achieved without active partnerships as it is a two way process between researchers and practitioners.

The UK registered charity called the 'Education Futures Collaboration' (EFC) has developed a specific model of international knowledge mobilization that harnesses digital technologies and new ways of sustainable working. Specifically, it aims to increase the accessibility of education research, best practice and professional knowledge by enhancing networking and collaboration amongst education professionals, internationally. It does this by promoting and disseminating education strategies and education research, through effective models of education research. It uses three different tools to achieve these aims:

> 1. Mapping Educational Specialist knowHow, otherwise known as MESHGuides (a translational research tool);
> 2. The Education Communities (a collaborative and online networking tool);
> 3. Research & Development & Review, otherwise known as RaDaR (groups set up to support systematic reviews through research and development of new and existing knowledge).

One key to this initiative is in understanding how 21st-century technologies can be harnessed to improve the quality, relevance and timeliness of educational research.

6

As outlined in figure 1, before the advent of the internet, educational research followed a one-to-many broadcast model, being print based where 'academic experts' published isolated studies which filtered into libraries, universities and government offices over time. Research findings were rarely accessed by educational practitioners and most often there were no feedback channels to the original authors. The internet and subsequent emergence of new technologies has provided an opportunity to change this model, as shown in figure 1, allowing for a many-to-many rapid dissemination and collaboration approach, across an international network of professionals.
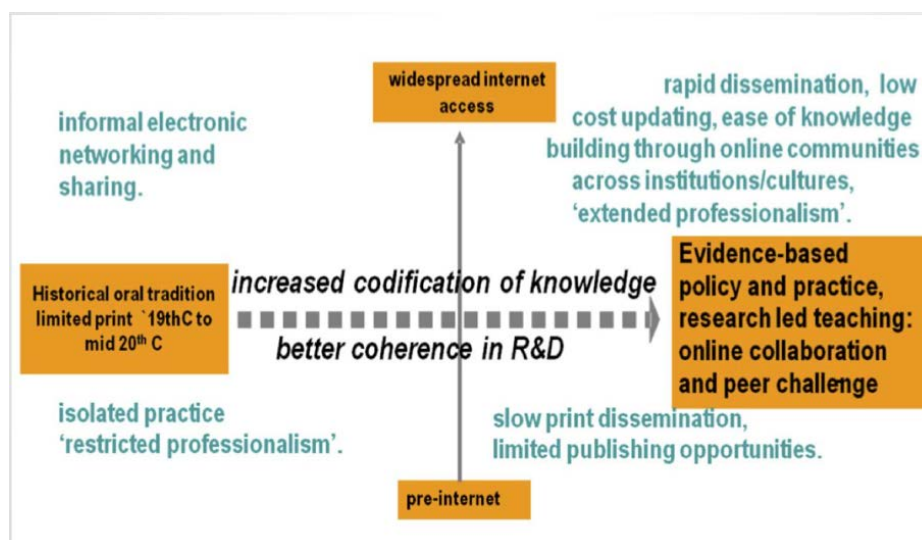
Figure 1: A model for knowledge management provision for education systems (from Leask 2012)

3.1 MESHGuides

Professional knowledge is not static. However, critical awareness of the key issues is essential, notably that there will never be enough additional funding to keep professional knowledge up to date unless we can harness the energies and resources already in education systems such as the research that is undertaken for Masters, EdD or PhD theses, together with the work of teacher researcher networks. Similarly, no country can afford the costs of providing CPD out of school for teachers (Burden *et al*. 2013). To this end, a strength of MESHGuides is providing an international knowledge management strategy through a website (www.meshguides.org), which provides online access to international education research. It uses a systems approach, designed to engage educators in building and updating the evidence base for practice. MESHGuides operates through volunteers in a variety of countries worldwide, taking on leading roles in developing and quality assuring research summaries in their own specialist areas. Although this is also a potential weakness, in relying on keen academics and teachers as volunteers.

The MESHGuides translational research project is designed to be managed by members much like a professional association, in order to ensure sustainability. MESHGuides does three things:

7

- Connects educators with summaries and sources of educational research
- Supports professional judgement with evidence
- Provides feedback loops so practitioners can inform academics, fostering partnership working

MESHGuides are represented in the form of an online guide, which are like multimodal maps or pathways, or graphical flowcharts. Each curriculum subject, has an editorial board of expert academics and teacher practitioners who review the guides once they have been written and submitted. The guides are then subject to blind peer review in an editorial process, which provides quality assurance similar to print publishing of educational research. This collaborative process allows academic researchers to contribute to a range of guides within their area of expertise and to interact and network with teacher practitioners in the same field across difference countries. This process is dynamic, enabling expertise to develop between researchers and teacher practitioners, which links theory and practice. This also aims to end the hermetically sealed circle of research being only available in academic journals, which are not accessible to teachers and are normally read almost solely by other academics.

MESHGuides utilises advances in web 2.0 technologies, being free at point of access, providing an overview of educational research on a given topic with reference to previous published research, thereby mapping the terrain to inform teachers, which then enables the profession to build on that knowledge to inform both future practice and research. The MESHGuides website, enables research to be accessible at the touch of a button, as any internet enabled device provides access to the knowledge maps. This means that the widespread uptake of mobile technologies will enable practitioners as well as academic researchers to connect to a large body of international research knowledge, which can support their own professional practice, which can then become research informed. Currently, the international relevance of the MESHGuides is evidenced by the fact that as of 15.03.2015 over 134 countries have accessed the website.

3.2 The Education Communities

Alongside the MESHGuides website providing access to the research base for educators, the translational research initiative also utilises a second type of technology, which is an online platform that links practitioners and researchers together via an online network that enables working groups to establish themselves and form a research team of academics and teachers. These communities of practice (Wenger, 1998) form around a research topic to collaborate and generate new research and interrogate prior research.

The Education Communities platform operates like a professional social networking site that facilitates an online interactive space for collaboration and research between practitioners and researchers (Younie and Leask 2013). It supports international partnerships, co-research and collaborative networks for innovative educators, engaged in improving the quality of education. New community work spaces can be

quickly set up to respond to needs of members. Membership to the platform is open to anyone interested in education. The Education Communities have been used for a variety of reasons by over 1,600 members representing over 85 countries worldwide. In a pilot study (Jones 2012) into the uses of the community, seven key uses where described. These included:

- General communities to share practice

- Writing books

- Cross institution research

- Journal articles

- Cross dept. / institution PhD students

- Funded Research Projects

- Finding partners for projects – research, publication, collaboration, bid writing including use by RaDaR groups and the creation of MESHGuides.

(Jones 2012)

Figure 2 captures the front page of one such community, "iPads, tablets and mobile devices RaDaR research group (EFC MESH project)". In this international community, teachers, academics and other stakeholders are reviewing research in their field that has previously been published and are building on that research, to generate new research for a MESHGuide. The functionality of the site as illustrated in figure 2 demonstrates a variety of collaborative tools such as forums, wikis, document libraries and blog spaces. Items can be tagged for easy location and sub communities created for specific project work. All members have their own home page, which includes a summary of their work and experience, with keywords tagged so at a glance other members know who is contributing to the debates, construction and ongoing development of research work. There is a people finder, which enables people to search for members using the tag cloud so they might conduct further research in collaboration.

Figure 2: An example of a community space in the online Education Communities

3.3 Research & Development & Review (RaDaR)

The Research & Development & Review (RaDaR) groups are networks of teacher researchers and academics who review and report on existing evidence and also undertake collaborative research where evidence is needed. In utilizing the online Education Communities, these groups generate research for MESHGuides and evidence for the knowledge repositories.

The way that educators, which includes academic researchers and teachers, can work with web 2.0 technologies to create and publish knowledge for, and by, one another has been conceptualised as communal constructivism by Leask and Younie (2001). Previously, knowledge production had been costly and slow. However, the development of ever cheaper and faster technologies, provides radical opportunities for educators to grasp the knowledge base of their own profession Through the collaborative creation of research through RaDaR groups and online peer review and peer challenge, educators are able to build new knowledge online together. Whilst it is beyond the scope of this paper, the philosophical and epistemological underpinnings of the knowledge mobilisation framework will be discussed in forthcoming papers and is theoretically informed by the earlier work of Leask and Younie (2001).

3.4. MESHGuides, The Education Communities and RaDaR in Combination

Figure 3, conceptualises the relationships between the EFC, which oversees the governance of the subsidiary projects, which are: MESHGuides, Education Communities and RaDaR. This provides a coherent and systematically organised approach regarding the development of an international knowledge management strategy for education. The EFC was established in 2010 and gained charity status in 2014. There is both a theoretical and practical underpinning to this worldwide initiative, with the epistemological foundations being that of communal constructivism, which utilises web 2.0 digital technologies, alongside the mechanisms that generate and review research (Younie and Leask 2013, 129).

Whereas libraries, academic publishing houses and web 1.0 technologies (read-only) provided access to a substantial volume of educational research, web 2.0 technologies provide educators with the opportunities for research generation and publication through online publishing, and networking to enable knowledge production, which includes review and challenge, by both the users and creators of research. This enables educators a radically new way to facilitate knowledge sharing and knowledge building in education (Leask and Younie 2001). The MESHGuides website utilises the internet to provide access to the research base for educators, and the second type of technology, which is an online platform, links practitioners and researchers through an online network that enables the RaDaR working groups, or communities of practice to collaborate to generate and interrogate research.
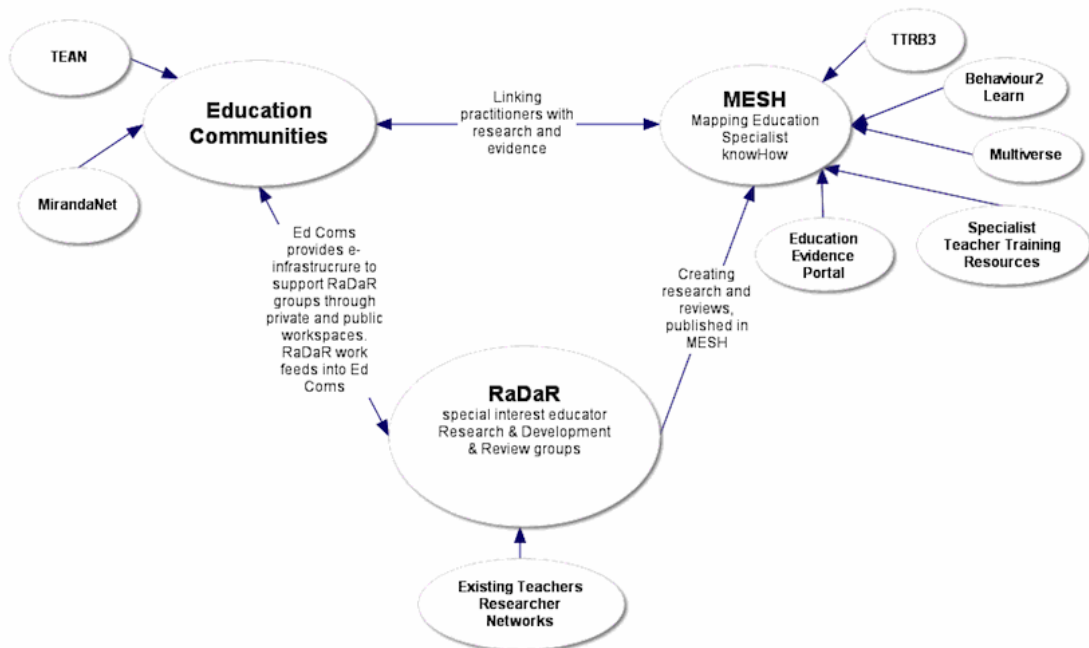
Figure 3: An early concept map link RaDaR, MESHGuides and the Education Communities, (Jones 2011)

Together these form an international participatory model of knowledge mobilization and management, which is both a collaborative and iterative process. Where research is finally published in the form of online MESHGuides, continued participation is enabled through the use of a comments box as a way for practitioners to provide feedback to the authors of the translational research guides. Using these comment boxes (on the MESHGuides website) and the Education Communities (online partnership spaces), practitioners are offered the opportunity to participate and be more involved in the creation and ongoing development of the MESHGuides. Practitioners are also invited to join editorial boards, which oversee the guides publication, so that they can be involved in the further development of the guides. Practitioners are also able to provide practical examples of how they have implemented MESHGuides in their classrooms. This is operationalised through the development of resources and lesson plans and through the sharing of practical strategies on the MESHGuides website.

The knowledge mobilization framework provides the opportunity for practitioners and academic researchers to work together to produce MESHGuides and practical strategies that are based on research knowledge, which also allow practitioners to have access to what Black and William describe as "a variety of lived examples of implementation" (1998, 15).

4. Initial Research into the Knowledge Mobilization Framework for Educators

Section 3 of this paper has described an international knowledge mobilization approach adopted by the EFC, which was inspired by a variety of initiatives in the field of medicine and other public sector organisations. Some initial pilot research has been carried out, specifically in relation to the MESHGuides approach, with teachers in the UK, which is now discussed in the following section.

4.1 Methodology

An online questionnaire was created to test the approach with teachers. This questionnaire was designed to provide data about the online pathways approach, see section 3.1 above. A paper based version of the questionnaire was piloted with 70 Newly Qualified Teachers (NQTs) who had seen a presentation demonstrating the approach. This elicited a good range of responses and thus an online version of the questionnaire was developed. This allowed respondents to explore a MESHGuide, in their own time, before answering a series of both quantitative and qualitative questions. The quantitative questions were in the form of a five point Likert Scale (1932) from 'strongly agree' to 'strongly disagree' and the qualitative questions were open ended due to their exploratory nature (Bailey, 1994). The questionnaire was posted online for a month and highlighted in the forums of the Times Educational Supplement. The initial page of the questionnaire highlighted that all data would be anonymous and only used for the purposes of research.

The questionnaire generated 46 responses from 219 unique visitors, giving a response rate of 21%. This questionnaire provided a good range of data about the proposed approach. The nature of the sample is first discussed followed by the quantitative data and then a discussion of the qualitative data.

Background information is reported initially to give some insight into the nature of the sample. The sample was 55.6 per cent female and 44.4 per cent male, compared to the actual workforce data, of 73.6 per cent female and 26.4 per cent male (DfE 2014, 7). The respondents reported that 25 per cent worked in primary schools, 68.2 per cent worked in secondary schools and 6.8 per cent in middle schools. The majority of the respondents were class teachers at 48.8 per cent, with 30.2 per cent heads of department, 9.3 per cent deputy heads, 2.3 per cent headteachers and 9.3 per cent stated their post as other. The highest level of education was reported as 22.7 per cent and was Postgraduate Certificate in Education (PGCE), 22.7 per cent were studying for a Masters degree (in progress), 20.5 per cent Masters degree (completed), 13.6 per cent Bachelors degree, 9.1 per cent Bachelor of Education, and 4.6 per cent had either completed a PhD or it was in progress. These data show that the respondents were from a broad range of different educational phases, roles and were in general highly qualified professionals.

4.2 Analysis of the quantitative data

Table 1 gives a more in-depth breakdown of the percentage scores for each of the eight quantitative items**.** Strongly agree and agree categories are added together to produce a positive score for each item. Similarly the same is done with the categories strongly disagree and disagree, this is done to simplify the analysis.

Table 1: Online questionnaire scores for the quantitative items with positive and negative scores conflated

No.	Description	Strongly agree and Agree (%)	Neutral (%)	Strongly disagree and Disagree (%)
Q1	This resource would be useful to me.	57.8	20	22.2
Q2	I would use this on a regular basis.	34.0	31.8	34.0
Q3	This resource would fit in with my planning and current practice.	53.3	13.3	33.4
Q4	The flowchart approach makes sense to me.	82.2	8.9	8.8
Q5	I would use this with colleagues.	56.8	18.2	25.0
Q6	I see no benefit to this resource at all.	22.4	13.6	63.6
Q7	This resource is easy to understand.	72.1	20.9	7.0
Q8	This has already been done.	17.8	53.3	28.8

It can be seen in Table 1 that teachers are positive about the MESHGuides approach as they score six out of the eight items positively. These findings are again shown in Figure 4 below in descending order of positive score. The results are discussed in more depth below in two broad themes those related to the design and structure of the MESHGuide approach, and those related to how teachers would use it and how it would fit with their current practice.
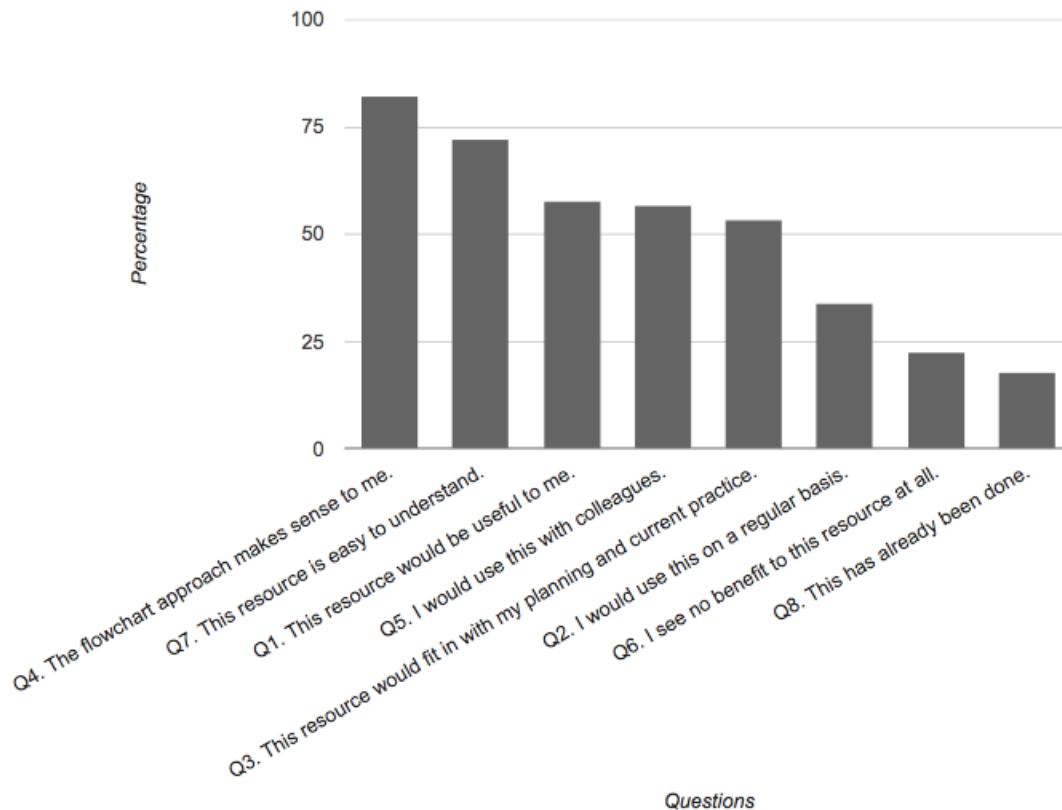
Figure 4: Online questionnaire items with positive scores conflated

4.2.1 Design and Structure

It can be seen in figure 1 that 57.8 per cent agree or strongly agree that the resource is useful with 20 per cent neutral. Furthermore, 82.2 per cent agree or strongly agree that the approach of using a flowchart to highlight how knowledge of a topic is linked together made sense to them. This is useful for the overall design and structure of the site. Moreover, 72.1 per cent agree or strongly agree that the resource was easy to understand, again the design needs to be intuitive and easy to use as possible, teachers do not need to be reading how to use the resource instead of just reading and reflecting on the content. As to whether this approach had been done before 17.8 per cent agree or strongly agree, with 28.8 per cent either disagree or strongly disagree, although 53.3 per cent of respondents were neutral about this item.

4.2.2 Fit with Current Practices

It can be seen that 34 per cent agree or strongly agree that they would use this resource on a regular basis, equally 34.1 per cent disagree or strongly disagree, and 31.8 per cent of respondents remaining neutral. This suggests that respondents would not use the resource on a regular basis. It will need to be considered how the resource can be more integrated into teacher's practice and teacher standards (Ingvarson, 2013; Flynn 2014). In the area of planning 53.3 per cent agree or strongly agree that this resource would fit in with their planning and current practices with 33.4 per cent disagreeing or strongly disagreeing and 13.3 per cent of respondents remaining neutral. This suggests that teachers would consult this resource to adjust

15

or reflect on their planning for a scheme of work, but may be unlikely to use it more regularly. As a collaborative resource 56.8 per cent of respondents agree or strongly agree that they would use this resource with colleagues. This idea of teachers working in collaboration has been shown to be effective in terms of student outcomes by Cordingley *et al.* (2005a, 2005b). The final question was phrased negatively to check the consistency of responses, and 63.6 disagree or strongly disagree with the statement that there was no benefit to this resource. Again it is noted that respondents thought that the resource had some overall benefit and that the strategy to check consistency worked.

Overall it can be seen from the quantitative data that teachers are positive about the approach, they are able to understand what the resource is designed for, how it is structured and how they can interact with it. The interface is intuitive and does not require training or instructions for teachers to use. Teachers are less positive that they would use the resource on a regular basis, maybe they see this as something that they would consult with respect to a specific problem when working on their planning, whether individually or with colleagues rather than one that they would use daily. Although the sample size for this online questionnaire was small it can be seen that this approach to gathering data about online resources through the use of an online questionnaire is worthwhile and has brought out some useful findings.

4.3 Analysis of the Qualitative Data

The qualitative data was gathered on the same online questionnaire thus for the qualitative data the sample size is relatively large. The qualitative data was gathered to provide more depth of understanding about practitioner's views on MESHGuides. The analysis again focuses on how practitioners use the resource and it fits with their current practices.

4.3.1 How would you use this resource

Respondents reported that they would use the resource both individually and collaboratively. Hence respondents would use the resource to improve their own personal practice decisions. Teachers stated that they would use the resource "as an aid to focus my own practice" (PT-3), "when planning" (ST-9), and "to back up decisions related to teaching practice" (PT-37).

Other respondents looked to use the resource more collaboratively with colleagues. For example, for "use with trainee teacher" (PT-3) and to "bring it into peer INSET training" (ST-39), and "this would be great for teacher training and staff CPD to get teachers to understand what evidence says about practice" (SHOD-16).

Although some of these responses are about individual teachers developing their own practice, the majority of comments are about discussion with colleagues, or developing and supporting colleagues, focussing discussion with colleagues or supporting Newly Qualified Teachers (NQTs) and students in the development of their own practice.

4.3.2 Fit with current practices

Respondents also stated that they would use the resource "when planning" (ST- 13), and "look at how I can cover the AFL criteria in my planning" (SDH-23), and also "I can use it to prompt ideas/remind myself of resources I already have when planning" (ST-46). So it can be seen that the resource would be used for dealing with specific problems or when reference material would be needed to support planning and schemes of work development rather than on a regular basis.

Other respondents commented how they would use the resource with colleagues in that "...it would enhance the sorts of discussions about teaching and learning we already have..." (SAST-7), and that they would use it "...when part of working party on AfL or other topics. As a reference material" (ST-13). Thus MESHGuides may be used to start or facilitate a conversation about how to improve teaching and learning outcomes.

Overall these data show that practitioners are open to the MESHGuides knowledge management approach and are willing to engage with the research resources both individually and collaboratively. One surprise from the data is how much teachers expect to use the resource collaboratively both in formal training situations, but also to start and inspire conversations around changes in practice. Practitioners do not mention using a resource such as this in the classroom. Thus there is an expectation that there need to be more translation by teachers from these research guides to schemes of work, lesson plans and classroom resources.

4.3.3 Analysis

What became apparent from these data is that practitioners conceptualised these research based resources in a web 1.0 way (read only) and that they wanted to use them to support their practice, but they do not mention that they may wish to contribute to the resources. There is no evidence, as yet, of practitioners seeing themselves as adding towards the development of the resources. MESHGuides as a project needs to be developed further so that practitioners feel that they can contribute to the process of developing the guides in the future. This may require a significant cultural shift in teachers consciously engaging with research as both a user and generator of research for professional purposes.

But as Stenhouse has stated, "the research act must conform to the obligations of the professional context" (1983, 20), hence teachers may be constrained by their context. Equally the lack of engagement may be due to the difficulties and apprehension of engaging with the research community; being an expert teacher is very different than being a novice researcher and engaging in the larger research community. Hall stated that "for the teacher researchers, their developing sense of self as agents within their own enquiries gives them 'permission' to engage more actively with the research methods and the products of others' research" (2009, 677). As teachers gain more confidence through their own research enquiries they develop a sense of self, allowing them to engage more actively.

Practitioners need to realise that they can contribute and produce research and have open dialogues with the 'expert' authors and editorial boards of the guides so that "lived examples" (Black and Wiliam 1998, 15) of practice can be brought into the guides. Hence there is not only the evidence from research within a guide, but also the examples from practice that contribute the authenticity of the guide. Due to the preliminary nature of this exploratory questionnaire we have not tried to triangulate the quantitative and qualitative data, although this analysis could provide useful insights for future work.

5. Conclusion

Knowledge management (KM) tools and web 2.0 tools are being adopted widely by private companies and other public sector organisations as ways of improving practice, but this is lacking and seriously under-developed in the education sector (Leask and Younie 2013). Early indications from research carried out in this paper, demonstrates a web enabled e-infrastructure, jointly owned by those participating in it, which both connects isolated initiatives in translational research and mobilizes international development capacity, allows for knowledge exchange and co-creation between teachers, teacher educators, policy-makers and academics at an international level. However, one of the challenges for this project is how to engage practitioners with research knowledge and also how to engage them in the production of MESHGuides and the production of classroom pedagogies and resources based on MESHGuides.

What makes this international knowledge management initiative significantly different to what is already in existence, is both the uniqueness of a joined up (creating a knowledge base that is dynamic and ever developing and not static), and that it is managed and developed by education experts, including practitioners in a feedback loop, and that it is independent of any government, and thus is not reliant on the 'policy of the day'. At its heart it is driven by a moral and professional commitment to raise learning outcomes for pupils through enhancing teachers professional practice worldwide, through providing access to the research-informed, knowledge base of the profession, free at point of entry. In so doing it directly addresses the UNESCO challenge of improving schooling by reframing the way teachers develop their professional knowledge. To this end, teachers and researchers can now have access to a knowledge mobilisation framework for entering into collaborative partnerships, where they can co-build a professional and shared knowledge base for their specialisms.

The international knowledge mobilization and management strategy advocated in this paper demonstrates the development and piloting of the e-infrasture, however, much more extensive research is needed to determine how the MESHGuides can impact on learner attainment for example, or how both researchers and practitioners are involved in the discussions around the use of research evidence, or on how the problematic issue of building a common, acceptable and methodologically robust tool for accumulating case studies is overcome. However, to date, the e-infrastructure has made an important contribution to the debate in the mobilization of knowledge, research and evidence-based practice in education in its attempt to join different

initiatives and to connect teachers, teacher educators, policy-makers and academics together internationally.

In conclusion, this international strategy of participatory knowledge mobilization and management provides an online environment that brings together, supports and further develops, a sustainable worldwide network of educators (teachers, teacher educators and academics) who wish to collaborate on, identify, publish and use evidence-based research to improve their professional practice. The Web 2.0 tools underpinning this have facilitated practitioners and researchers gathering in the production of MESHGuides. The challenge now is how to turn this into a sustainable ecosystem so that practitioners can add to the development of new knowledge, thereby truly embedding translational research in the field of education.

Acknowledgments

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