

**Mobilising Knowledge through Global Partnerships to Support Research-informed Teaching: Five Models for Translational Research**

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**ABSTRACT**

Improving the quality of teaching is of global concern: UNESCO's Sustainable Development Goal (SDG) 4c in the Education 2030: Framework for Action calls for high quality teaching for all. The OECD challenges the education system to improve Knowledge Management. JET's (2015) special issue: *Translational Research (TR) and Knowledge Mobilisation in Teacher Education* introduced the concept of 'translational' or 'theory to practice' research - well-established in medicine but not in education. Five TR models were subsequently developed by the MESH charity's international network with organisations in South Africa, Bangladesh, Australia, Pakistan, UK. These distinct models engage 1) university staff and teachers 2) subject associations, 3) research units, 4) an international NGO working in crisis settings, 5) PhD tutors and students. Each model shares common features forming the MESH Translational Research methodology introduced in this article. A TR repository is part of the MESH knowledge mobilisation strategy giving teachers access to research summaries which, overtime, accumulate knowledge. TR publications called MESHGuides ([www.meshguides.org](http://www.meshguides.org)) complement existing forms of publication. This article proposes the MESH TR methodology as one affordable and scalable solution to OECD and UNESCO's challenges of keeping teachers up-to-date and making new knowledge accessible to teachers regardless of location.

keywords: communal constructivism, innovative methodology, knowledge management, knowledge mobilisation, translational research, research-informed, evidence-based, UNESCO, OECD, SDG

**INTRODUCTION**

*'The limits of my language mean the limits of my world,'* (Wittgenstein, 1922, p.149, 5.6)

Wittgenstein's observations explain one of the major problems we, and others, suggest the education sector faces in achieving research-informed teaching: the lack of shared language and shared understanding of key concepts around: pedagogy (Simon, xx; Livingstone et al, 2017), forms of knowledge for teaching (Shulman, 1987) and research, including translational research ie research that bridges the theory to practice divide. This article's contribution to developing a shared language and shared understanding of new concepts is to describe and analyse five models for 'translational' research, in order to identify the core features of translational research as it applies to the education sector.

We also make the case for the potential for a systematic approach to translational research to address improvement challenges to the education sector identified by the OECD and UNESCO. Almost twenty years ago, the Organization for Economic Co-Operation and Development (OECD) stated that the "rate, quality and success in knowledge creation, mediation and application are relatively low in the education sector compared with other sectors" (2000, p. 103). Since then, regular reports from international organisations

such as UNESCO and the OECD (2000, 2003, 2009) have outlined the challenges countries face in meeting the professional development needs of teachers in order to ensure that their teaching is up-to-date and research-informed and thus has the greatest impact on educational outcomes. Despite this longstanding concern, research and analysis continues to indicate that the education sector in many countries lags behind other professional sectors in taking advantage of digital tools to support knowledge management<sup>[1,2]</sup>; specifically for coherent provision of continuing professional development that can provide teachers with access to the latest research-informed knowledge (Leask and Younie, 2013).

The challenge of translating research evidence into effective practice for teachers is well documented (Leask and Younie 2013, Jones et al., 2015). While teachers are interested in research and value it, they find it difficult to engage with it in their daily work (Procter, 2014). Despite the many excellent case studies that show how educational research has had a significant effect on policy and practice (e.g. BERA, 2013; REF, 2015; AcSS, 2016), impact remains inconsistent. Buchanan (2013) argues the impact of even large investments in social science 'is still a matter of chance' (p.185). This is clearly the case in the education sector where the lack of significant progress in knowledge management is not due to a lack of initiatives (EFC Global Summit Report, 2016).

In other sectors, the calls for the development of 'research-based' practice since the 1990s (Buchanan, 2013) have led to major initiatives such as the National Institute for Clinical Evidence (NICE), Cochrane Collaboration (focusing on healthcare) and the Campbell Collaboration (focused on social interventions). These initiatives are not merely online repositories of research papers, but translate the research into an accessible format. Similarly, we would argue that research-informed teaching requires evidence to be available for developing pedagogic practice for all subject areas, about how to most effectively teach each concept in each curriculum area, for all ages and types of learner.

Goldacre (2013) argued that there was a 'huge prize to be claimed' by the education establishment to create, develop, and use a shared knowledge-base to improve the ways teachers use evidence to affect the outcomes of pupils. However, how teaching professionals access and contribute to this knowledge-base remains a heavily debated and thorny issue (Hammersley, 1993, 2001, 2002, 2007, 2013; Fagundes, 2016; Gore and Gitlin, 2004; Hollingsworth, 1992; McLaughlin et al., 2004; McIntyre, 2005; Mincu, 2013; Poultney, 2017; Wiliam, 2002). Developing teaching as a research-informed profession, which is school-led and connects into a self-improving system is complex (Hempenstall, 2006; Leat et al., 2014; Horvath et al., 2017). Arguments are levied against this development on the basis that teachers are not fully-fledged researchers (Hillage et al., 1998; Wiliam, 2015; Stewart, 2015) along with the difficulties practitioners face in finding and using research evidence in an accessible way (Procter, 2014; DfE, 2016:39).

## **ADDRESSING THE CHALLENGE OF RESEARCH-INFORMED TEACHING**

One response to these challenges is the MESH (Mapping Educational Specialist knowHow) system developed by an international group of educators to provide the education sector with an accessible, comprehensive knowledge-base to support research-informed practice in subject teaching in classrooms (Burden, Younie and Leask, 2013). This system builds on the foundations of 20 years of research into forms of teacher research, type of teacher knowledge (MESH, 2018) and the use of digital technologies to support access to research-based knowledge for teachers (see Younie and Leask, 2013, EFC Global Summit Report, 2016).

MESH provides a system for knowledge management (KM) through the communication and dissemination of research for professional practice in the form of 'MESHGuides' ( [www.meshguides.org](http://www.meshguides.org), for an example, see Figure 1). MESHGuides summarise educational research that is relevant to teachers' professional practice and present this in the form of graphical flowcharts rather than as prose with research condensed into accessible blocks. While the published MESHGuides provide an accessible format for disseminating

professional knowledge, the method through which they are constructed is a ‘translational research’ strategy that mobilises the knowledge held by researchers and translates this into a form suitable for other professionals. This strategy of creating ‘translational research’ (TR) is open to all relevant stakeholders in education and utilizes digital tools to address what has to date been an intractable problem - access to research-based pedagogic knowledge. It thus provides a quality-assured, systematic process for creating a bridge between researchers and practitioners.

Figure 1: Example of a MESH Guide (EAL)

The screenshot shows the MESHGuides website interface. At the top, there is a blue header with the text 'MESHGuides', a search bar, and a language selection dropdown menu. Below the header, the page title 'EAL' is displayed. A navigation bar includes the author's name 'Naomi Flynn' and links for 'View as single page' and 'Comment/Feedback'. The main content area is divided into two columns. The left column features a flowchart titled 'Teaching and Learning for pupils with English as an additional language'. The flowchart starts with a central box at the top, which branches into five boxes: 'Evidence', 'Identifying the teaching context for EAL learners', 'Developing language and literacy for EAL learners', 'Resourcing the teaching of EAL learners', and 'Case studies'. Each of these boxes further branches into more specific sub-topics, such as 'How to use this MESH Guide for EAL', 'Key principles and teaching strategies', 'Spoken English for new to English learners', 'Integrated literacy activities', and 'Case studies 5-7 years'. The right column contains a section titled 'Key principles and teaching strategies'. This section includes a paragraph of introductory text, followed by a list of 'Key Principles for EAL Learners' and 'Key Teaching Strategies for EAL Learners'. The principles list includes items like 'A safe and welcoming language environment with minimal anxiety about performing in the new language is essential' and 'Conversational fluency is fundamentally different from academic fluency'. The teaching strategies list includes 'Promoting social well-being for EAL learners through detailed induction documentation' and 'Providing opportunities for talk-based activities and interaction wherever possible'.

The creation of the MESHGuides system is a form of ‘communal constructivism’ (Leask and Younie, 2001), whereby digital tools help to bring international networks of educators together to collaboratively construct new knowledge. The benefits of this digital infrastructure are set out by Jones, Procter and Younie (2015) who note that due to their open online accessibility, by 2015, the guides had been accessed by readers from 134 countries. More recent data demonstrates that the MESHGuides had been accessed from 193 countries by August, 2018. As a result, the guides can be used to provide access to teacher professional knowledge in countries for whom raising the quality of education is a particular challenge and priority, for example, Pakistan (Leask and Jumani, 2015) or to meet the challenges of EAL faced by countries with small populations or economies, thus helping to address UNESCO SGD4c, to improve the quality of teaching. In addition, because the guides are online, they can be regularly updated, to keep teachers current with both subject-content and new pedagogical approaches as they develop and new research is made available.

Evidence from initial testing of the guides shows that teachers perceive the use of MESHGuides as having a positive impact on their planning and pupils’ learning (Ovenden-Hope and la Velle, 2015). In 2017, an international online questionnaire about the MESH strategy (Procter and Younie, forthcoming) found that 74 per cent of respondents reported that the guides were easy to understand and that 83 per cent would recommend them to colleagues. A challenge for the MESH system is articulated by Jones, Procter and Younie (2015) who noted that practitioners conceptualised the guides as sources of knowledge that they could draw

on, but that a cultural shift would be needed before practitioners felt able to contribute research to the guides themselves.

Following the announcement of the UNESCO Sustainable Development Goals in 2015, an EFC (Education Futures Collaboration charity) Global Summit was held in London, to consider how a knowledge management strategy could assist in the achievement of Goal 4c: “Ensure inclusive and quality education for all and promote lifelong learning” (UNESCO, 2015, p.1). The reports that resulted from the summit (EFC, 2016, 2017) built on earlier work setting out the problems and solutions for knowledge management (KM) in education and concluded that with consistent national and international leadership supported by an administrative infrastructure, professional practice could progress swiftly to become research-informed.

### **Working in Partnership with Global Stakeholders**

While the research discussed above has shown the potential benefits of the MESH system, there are several remaining challenges, particularly managing expansion and scaling up of engagement. The focus of this article is to build on the earlier conceptual work (e.g. Burden, Younie and Jones, 2013) by reporting on experiments since 2015 in developing models for **mobilising the knowledge held through organisations, to produce translational research outputs**.

Here, we present five models that illustrate how the MESH translational research method can be applied in practice. Models, as organising frameworks enable us to understand complex phenomena and to develop multi-faceted processes to represent and deal with those phenomena, in this case the translation of new research knowledge for teaching.

The five models presented here demonstrate that the MESH translational research system provides a dynamic process, specifically using the affordances of technologies for easily updating online publications, to enable the accumulation and updating of research knowledge relevant to teaching. The description of the five models below is followed by a summary of their common features in order to define an emerging model for a MESH Translational Research system.

### **FIVE TRANSLATIONAL RESEARCH MODELS - Stakeholders and Researchers working in Partnership**

The five models illustrate how the MESH translational research method has been applied in practice through partnership with different stakeholders. As Jones, Procter and Younie (2015) have discussed, the MESH approach has always been a participatory model involving the commitment of researchers and practitioners. However, as the five models discussed here show, over time, the MESH approach has been developed to encompass a much broader range of global partnerships. The models are presented chronologically and show how the partnerships developed from collaborative international case studies of experimentation with the MESH TR methodology, working with partners from Bangladesh, Pakistan, Australia, South Africa and the UK. The types of partnerships now include:

- regional/local networks with university, school and local authority staff working together,
- a specialist research institute,
- professional associations,
- an NGO, and; with
- via a national validating group, PhD supervisors and their students.

The first three models are well developed and the MESHGuides produced through these models have been evaluated. While the first MESHGuides to arise from Models four and five have been published, these models continue to be developed and evaluated. In particular, Model 5 is of a different type because it outlines an

emerging national model for mobilising knowledge commonly left hidden in doctoral theses. We suggest that doctoral theses are, for the education sector, a largely untapped source of knowledge coming as it usually does from individual's particular interests rather than organisational remits. All of the MESHGuides listed can be found on [www.meshguides.org](http://www.meshguides.org).

### **Model 1: Collaborations within a region: local authorities, universities and teachers**

The first MESHGuides to be produced were the outcome of collaboration between university academics and practitioners. The MESHGuides for Spelling (Harrison *et al.*, 2014), Clinically Based Teaching (Flynn *et al.*, 2015, McLean Davies *et al.*, 2015) and English as an additional Language (Flynn *et al.*, 2015) are examples of sustained collaborative work between teachers, local authority colleagues and university researchers. This combination is particularly helpful because as Flynn *et al.* (2015) point out in the context of the English as an Additional Language MESHGuide: "the MESHGuide will potentially serve teachers effectively, because it was written as a collaborative act between practising teachers, specialist teacher advisors for the teaching of EAL and an academic with a research interest in the teaching and learning of EAL." (p.17).

In this model, university academics identified aspects of research knowledge that had not been effectively disseminated to practitioners. They then worked with practitioners and local authority experts to translate the research in to a more appropriate form and to evaluate this. Sponsorship was provided by universities and an anonymous donor.

### **Model 2: Collaboration with a national professional subject association**

Professional subject associations are independent membership organisations with expertise in specific curriculum subjects. Members of these associations are experts in their field and have an interest in how their subject is taught in schools and other educational settings. This model developed from an experiment to see if and how subject associations can adopt the MESH system in order to disseminate their professional knowledge to schoolteachers. While in Model 1, the university researchers, teachers and local authority colleagues in their network identified research knowledge to disseminate more effectively, in this model, the subject associations identified the need and then commissioned academics and other experts to summarise and mobilise this knowledge.

For example, the Association for IT in Teacher Education ([www.itte.org](http://www.itte.org) but now the Technology, Pedagogy and Education Association) funded four knowledge mobilisation scholarships to accumulate and synthesise knowledge relevant to its members, which is relevant to teachers delivering the new computing curriculum in England. Members of the association applied for the fellowships by identifying a specific practitioner need or gap in the knowledge-base. The role of the association was to select those topics that were most relevant to its members and fund these. Several subject specialist pedagogy MESHGuides are the result of this partnership with a professional subject association (Cox and Caldwell, 2018; Iredale et al 2018).

Similarly, having identified a pressing need amongst practitioners, the British Association of Teachers of the Deaf (BATOD) was awarded UK lottery funding to develop MESHGuides advising teachers on supporting deaf and hearing-impaired children in the classroom. BATOD brought subject content experts together with teachers and local authority advisory staff to produce MESHGuides on Acoustic Accessibility (see Rosenberg et al., 2016) and other areas (Cued Speech, Radio Aids, Glue Ear) where teachers can benefit from specialist knowledge. As BATOD state,

"MESHGuides, in its embryonic stage, stand at the juncture between [research and practice] as an opportunity and vehicle to move the wealth of the existing and growing underpinning research for education of the deaf, very actively and pragmatically into the minds and hands of those who are at the chalk face." (Rosenberg, et al., 2016, p.856).

### **Model 3: Collaboration with individual specialist research institutes**

The first two models were firmly rooted in practice with the inspiration for MESHGuide topics arising from the research of teacher educators or from subject associations concerned with teaching and teacher development. However, University-based Research Institutes outside of teacher education departments often generate specialist-subject knowledge that has relevance for subject teachers.

In this case an example of collaboration with a microbiology research unit is the focus. Collaboration between educators and the 'infectious diseases research unit' produced a MESHGuide for early years teachers covering subject-content knowledge and subject-pedagogy on the transfer of viruses and bacteria (Laird et al., 2018).

The UK based infectious diseases research unit worked collaboratively with the Environmental Sanitation Institute (ESI) in India to test out the resources with community health workers and early years teachers. The multi-disciplinary research team developed educational resources for delivery to children, teachers and healthcare workers to reinforce learning about health and hygiene, particularly infection control. The team also delivered a series of workshops to share pedagogic activities, which have since been implemented in schools in the UK and India. MESHGuides are not limited to print. By creating culturally relevant books, online games and posters on hand washing for children in several languages with support from UNICEF, these resources have been tested in workshops and evaluated by the research team. The resources have been collated into a MESHGuide, to make the research globally accessible and free at the point of access. Sponsorship was provided by WaterAid and through crowd sourced funding.

### **Model 4: Collaboration with an international NGO**

The first three models were rooted in the education sector through universities or subject associations. However, another model which has been tested is for the MESHGuide to be commissioned by a non-governmental organisation. Voluntary Service Overseas (VSO) is an independent international development organisation that supported over 2.4 million people in 24 countries in 2016-17 (VSO, 2016-2017). In January 2018 VSO identified a need for research-informed materials to support volunteers working in early childhood education in the Rohingya refugee camps in Bangladesh and approached the MESH network with an invitation to test out the MESH knowledge mobilisation system for use in emergency settings in getting the latest research-based knowledge to users in this case the context was early years education in emergency settings and the users were those in the camps with young children, particularly mothers and big sisters.

Over a twelve-week period, an international MESHGuides advisory board on early years education was established and research knowledge was pooled from 40 educators in six countries and summarised. As a result, an extensive MESHGuide for "Early Childhood Care and Education in Emergencies" was produced, along with summaries for parents and training materials for local community leaders who were then working with these groups (Laxton et al 2018 a,b,c; VSO 2018a,b,c,d) .

The outcome as of July 2018 is that early VSO evaluations show that materials which had been translated and adapted to the local context were well received, were being disseminated and cascaded and that children were benefiting (Shresthra, 2018). Ongoing evaluation is being undertaken.

A second stage of the initiative is to share the MESHGuides from mobile phone to mobile phone without access to wireless networks using USTAD technology and following a successful pilot in Afghanistan. The evaluation of the implementation of this model will be reported by VO in due course. A third stage is to adapt the materials to other emergency settings.

Sponsorship was provided by VSO and through a public campaign.

### Model 5: Mobilising knowledge from doctoral theses: a national strategy for selection

In the USA, over 5,000 doctorates in education are awarded annually (NSF 2018b). While no global statistics are available, that doctoral study in education is a popular field internationally can be seen by the large numbers of universities worldwide that offer PhD and EdD programmes. The majority of these programmes require their graduates to complete a substantial piece of original research and present this in a thesis or dissertation. While not all doctoral topics will have immediate relevance to education practitioners, a significant proportion of this work may contain knowledge and insights that would help to improve education. However, despite many thousands of doctoral theses being completed each year, the impact of this body of doctoral work on education and teaching is unclear. Liberating such knowledge from doctoral research for practical use by teachers is doubly challenging; not only due to length and time required to read and understand the theses, but also in its use and applicability. While the thesis will be likely to be made available in a university library and published online it may not be easily accessible to the teachers who might be best placed to apply this knowledge. This is a particular problem for international graduates where a doctorate may have been achieved and published in a different country from that where the data was collected or where the author may have hoped to have most influence. The MESHGuide approach provides a method for sharing doctoral research in an accessible and user-friendly form, thus ensuring that the insights and research from doctoral work are translated widely and that the potential impact on schools, teachers and pupils is maximised.

This case study outlines a process for translating doctoral work into a MESHGuide. At the initial development stage, two of the authors worked with doctoral students from the University of Pretoria to design and trial the process. As a result, six stages to creating a MESHGuide from a doctoral thesis were identified (see Table 2). For an example of a MESHGuide resulting from this process, see Malan Van Rooyen's work (2018) on the A to Z on [www.meshguides.org](http://www.meshguides.org); also other earlier examples from PhD theses are Bhatti (2017), Crawley (2016), Jones (2016).

Table 2: Process for translating doctoral research to a MESHGuide

Stage	Summary
1. Identification and recruitment of authors	<p>Initial identification works on three levels:</p> <ol style="list-style-type: none"><li>1) Participation is sought from a senior representative of an internationally-recognised university</li><li>2) University representative identifies key, experienced doctoral supervisors</li><li>3) Supervisors identify recent doctoral graduates who have produced relevant, high-quality work</li></ol> <p>The graduates are then approached individually.</p>

<p>2. Clarify requirements</p>	<p>Through the use of guidance documents, example MESHGuides and templates, prospective authors are familiarised with the purpose and structure of a MESHGuide. A key purpose of these resources is to support authors in identifying a suitable topic for their guide and to adopt a suitable writing style.</p> <p>Once a topic is proposed, the MESH Editorial Board check for potential duplication with other guides before writing begins.</p> <p>Once the proposal is approved, authors are allocated a subject-specific editor who can support them throughout the process.</p>
<p>3. Draft</p>	<p>The author translates the knowledge, insights and concepts from their doctoral research into the MESHGuide format (with support from an editor as required).</p> <p>As the existing MESHGuides share a common structure that has been proven to work for a number of topics, this can provide a supportive framework to help the writing process.</p>
<p>4. Edit</p> <p>Peer review by academic experts</p> <p>Quality assurance process step 1</p>	<p>The first draft of the guide is peer-reviewed by the subject-specialist editor. They check that the guide meets the requirements of the MESHGuide format and that it is of an appropriately high quality.</p> <p>The editor may suggest revisions that the author will need to make before the guide can be accepted.</p>
<p>5. Test</p> <p>‘Translating’ into practice</p> <p>Practitioner review</p> <p>Quality assurance process step 2</p>	<p>Once accepted, the draft guide is then tested by teachers. The author or editorial board will nominate two or three individual teachers to read the guide and to comment on its relevance and clarity.</p> <p>Any subsequent revisions will then be made by the author before moving to the final stage. Elements of these teacher peer-reviews may be published alongside the completed MESHGuide, providing a dynamic feedback loop from practitioners.</p>



<p>6. Publication</p> <p>Innovative 'online knowledge maps' with graphical interface</p> <p>Updatable: developing a dynamic knowledge-base</p> <p>Dynamic: providing a continual feedback loop from academic researchers and practitioners</p>	<p>After testing is complete, the subject specialist editor will pass the MESHGuide to the General MESH Editorial Board for final approval.</p> <p>Once accepted, the draft MESHGuide is converted to the online format by the web-publishers and published online. The publication is then announced through the MESH newsletter and social media channels.</p> <p>MESHGuides should be updated as new evidence and research emerges. Over time, teachers (users and readers) may suggest updates. Also the author may wish to update the evidence in their guide. Suggested updates will normally be decided by the original author and agreed with the relevant editorial board. After an agreed time, the author will also be asked to review the MESHGuide they have created to ensure it remains up-to-date.</p>
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## DISCUSSION: Common Features of an emerging model for a Translational Research System

The five models introduced above illustrate how different partnerships have implemented the MESH system and developed translational research practices for the teaching profession. Each of these processes is the subject of regular evaluation and review so that they can be further refined and improved. While the models differ in significant ways, we can identify a number of common features that define a Translational Research System, including: engagement with stakeholders throughout the whole process; quality assurance, democratic participation.

### *Engagement with Stakeholders*

All five models include the dynamic engagement of end-users (teachers) with researchers. The aim of translational research is to provide a bridge between research findings and practitioners such that the research can be translated into practice. Arguably the MESH system provides an innovative methodology that utilises a number of different models to harvest research for practitioners; specifically teachers for their professional practice and to facilitate the move towards research-informed teaching. The models demonstrate that the stimulus for creating a MESHGuide can come from researchers (including doctoral students) but can also arise directly from the needs of practitioners via subject associations or non-governmental organisations.

It is vital that MESHGuides are accessible for teachers and this is ensured through several features of the models. Firstly, from a very earlier stage, **training** is provided to ensure that the authors understand the purpose and structure of a MESHGuide and, in particular, understands how the writing style of such a guide differs from that of other research reports. This can be achieved through virtual or face-to-face meetings (e.g. Model 4) or through guidance materials (e.g. Model 5). The structure of the guides also helps to ensure

that the author is focused on how their work might be applied, for example, through the inclusion of case studies, interventions, and instructions for using the guide. Finally, a test phase ensures that practitioner **feedback** is integrated into the MESHGuide and that potential misunderstandings are avoided.

There are several potential developments that can already be identified as worth considering. Firstly, Flynn et al (forthcoming) suggest that it is beneficial for practitioners to be involved earlier in the drafting of a MESHGuide. In their development of a MESHGuide to support the teaching of bilingual learners (Model 1), early involvement by teachers improved the quality and relevance of the final guide.

### *Democratic Participation*

The act of creating a MESHGuide might be conceived as a moment of increasing participation in an international educational community (communal constructivism). The models value the work of practitioner and doctoral students as well as that of established researchers. While some MESHGuides are the product of experienced researchers working in national funded research institutes and universities (e.g. Model 3), the range of models discussed here ensures that MESHGuides can be written by those in less powerful positions in academia. Also, these processes enable teachers to have a voice as end-users and comment on the guides for practice, both prior to publication, when in the role of peer-reviewers, and through giving feedback once published. In fact, the MESH process sees Guides not as 'completed' or 'final', but as requiring regular updating and revision to reflect new research findings. This in turn forms a 'dialogue', a dynamic approach that allows for the possibility of the creation of new knowledge, in the form of communal constructivism (Leask & Younie, 2001), which acknowledges the role of teachers' situated knowledge construction and draws on theories of distributed cognition, situated learning, and social constructivism. The technology used in the creation and maintenance of the guides thus lead to new ways of working using digital tools.

### *Quality Assurance*

For MESHGuides to be accepted and implemented by practitioners, it is vital that the research underpinning the guides is of high quality and that the translation to practice of these findings is fully warranted by the evidence available. Therefore, all models have to pay careful attention to how they assure the quality of the guides. For example, in Model 5, we can rely on the quality assurance processes, reputation and expertise of the university to provide some confidence in the quality of the work, which is further verified through the role of external examiners. It is important that experts within a country identify that potential universities are genuine, respected institutions that follow the expected quality assurance processes of their host country. It is not expected that universities from different localities will have the same processes or expectations, but they must be well-respected within their country and preferably internationally. For the first stage of doctoral MESHGuides (Model 5), MESH has worked with an internationally recognised, highly-ranked, research intensive university.

Once the institution has been identified, the next stage of Model 5 is to select key doctoral supervisors who work in areas of relevance to education and who have a track record of supervising high quality doctoral students. These supervisors can be identified and approached by senior academics within their university. The identified supervisors then select those doctoral students that they believe are producing work that could be suitable for a MESHGuide. These will either be recently completed graduates or close to submission of their thesis. This three-part identification process assures the quality of the research at three levels:

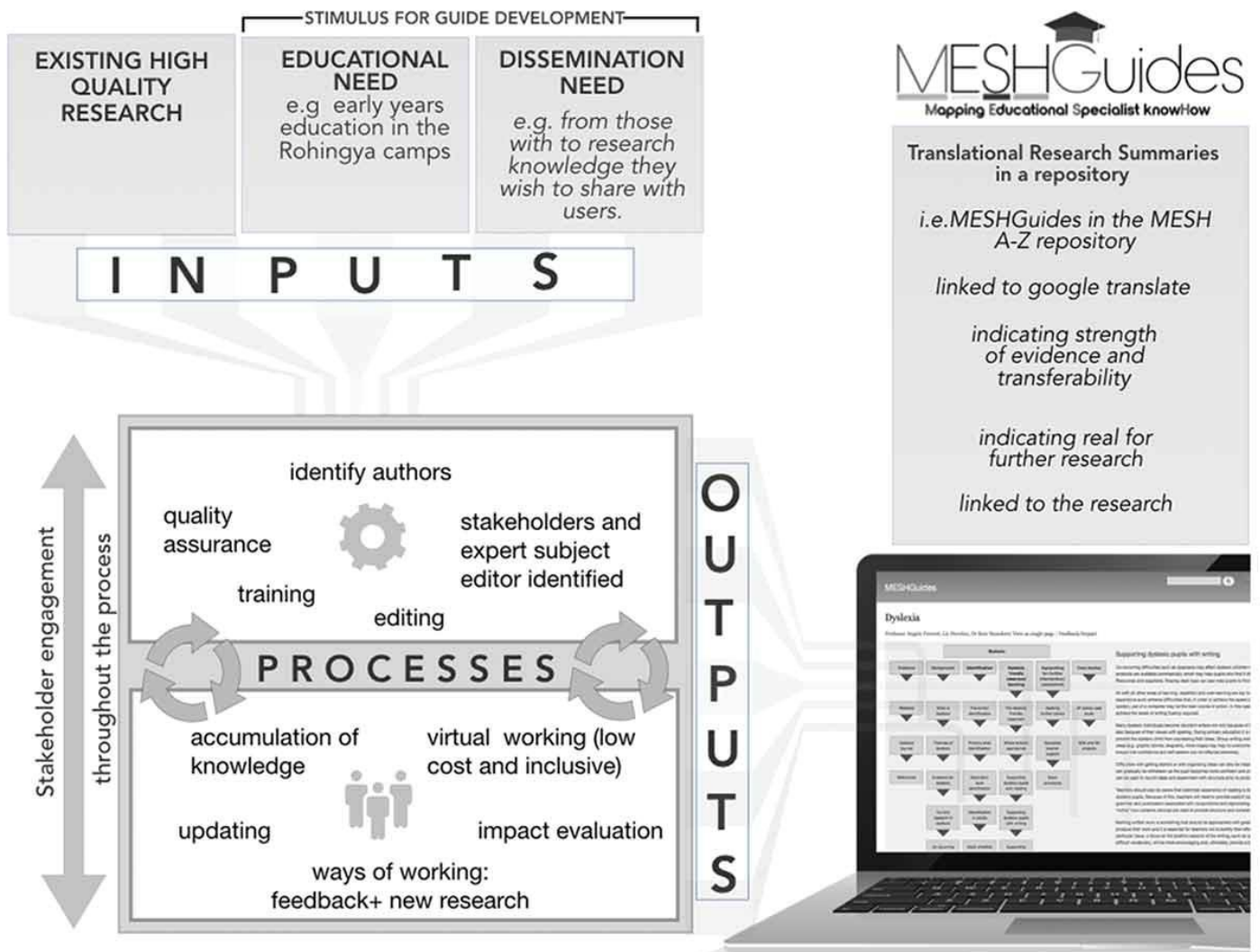
university, supervisor and student, and ensures that the research that the guide will be based on is rigorous and has already been subjected to a stringent examination process, via internal and significantly external examiners. This process, therefore, relies on the quality assurance and academic judgement of participating universities, as well as the process of quality assured peer-review of the MESHGuide publishing procedures. This process of 'translating research' from doctorates is efficient and takes advantage of the high level of accountability that universities face.

### ***The Translational Research System***

The five models demonstrate effective ways of building partnerships with a range of different stakeholders in order to mobilise knowledge to support research-informed teaching. As new partnerships explore how they can make use of the MESH TR approach, these models provide templates for action. We propose that the common features of these models should be the essential components of future partnership models.

Figure 2 summarises the common features of the models. A model is described typically as an inputs, processes and outputs system. In this case, the MESH TR System includes *inputs* from a broad range of partners including researchers, practitioners and organisations. It proposes *processes* that are mediated by principles of stakeholder engagement, democratic participation, and quality assurance. And it results in *outputs* that are dynamic MESHGuides that are updated and reflect the current thinking and research of the communities that created it. These key elements are summarised in Figure 2.

*Figure 2 - Summary of common features of the MESH Translational Research System.*



## CONCLUSION

Despite the successful development of knowledge management and research-informed systems in the healthcare, engineering, nuclear industries, and defence sector, there has been limited success in creating similar systems for education. Arguably there is no justification for knowledge management standards and practices in the education sector to be lower than those expected of other sectors of the economy.

Similarly, while translational research is a concept and practice well established in the medical sector it is under-theorised and little known in education systems.

The paper has set out a low-cost sustainable system, with an innovative methodology that includes a variety of models for translational research in education, with specific roles for education stakeholders. Specifically it outlines how collaborative partnerships can facilitate the harvesting of research knowledge from organisations (such as NGOs, research institutes, professional subject associations and other relevant stakeholders) to provide a way to realise the vision of teachers anywhere to have access to up-to-date subject-content, and access to the latest pedagogic research relevant to concepts in their subject.

Governance of an international TR knowledge management system is, however, a challenge. As Blamires (2015) has shown, realising research-informed practice for teaching is costly if existing resources are not

maintained. In addition, individual countries (developed and developing, particularly those with small populations and small economies) cannot keep teachers updated in all subject areas if they work alone.

The authors conclude after careful analysis that the challenge of providing a global educational knowledge management system is larger than any one individual country can manage except perhaps countries with large economies. This led the EFC Global Summit (EFC, 2016, 2017) to propose establishing an international collaboration, a World Education Council, to lead in this endeavour and provide coordinated leadership. Educators across countries are giving their time and support to create the MESH system, freely sharing research knowledge for the greater benefit of all. However, a World Council for Education could harness and coordinate efforts more effectively. Successful developments in different contexts in other disciplines e.g. Cochrane Collaboration, European SchoolNet, Wikipedia provide models of governance and funding which provide a sound foundation for scaling up the MESH TR system for education.

This paper outlines translational research models for mobilising research knowledge to support research-based teaching which can be used by NGOs, charities, governments, professional associations and research-institutes. The models coupled with the curating the TR in one repository (like Wikipedia) provide a resource to support upskilling teachers everywhere and a means of supporting UNESCO's SDG 4c.

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[1] Knowledge management refers to a system in which individuals, organisations and sectors can: find, use, share, create and manage knowledge relevant to their field.

(2) See for example, UK Cambridge University's Office for Translational Research (<http://otr.medschl.cam.ac.uk>).

## References

AcSS (2016). Making the Case for the Social Sciences: No. 12 Education. *Academy of Social Sciences/BERA*. Available at: <https://www.bera.ac.uk/researchers-resources/publications/making-the-case-for-the-social-sciences-education> [Accessed 29 May 2017].

BERA (2013). *Why Educational Research Matters*. BERA Available at: <https://www.bera.ac.uk/researchers-resources/publications/why-educational-research-matters-3> [Accessed 28 May 2017].

Bhatti, A. (2017). *Understanding Curriculum*. International Islamic University in Islamabad. MESHguides <http://meshguides.org/guides/node/777> [Accessed 28 July 2018].

Buchanan, A. (2013). Impact and knowledge mobilisation: what I have learnt as Chair of the Economic and Social Research Council Evaluation Committee. *Contemporary Social Science*, 8(3), pp.176-190, Nov. 2013. ISSN: 21582041.

Burden, K., Younie, S. and Leask, M. (2013). Translational research principles applied to education: the mapping of educational specialist knowhow (MESH) initiative. *Journal of Education for Teaching: International research and pedagogy*, 39(4), pp.459-463.

Cox, A. and Caldwell, H. (2018). *Technology Enhanced Learning Communities*. Technology and Pedagogy in Education Association (previously ITTE). MESHGuides. <http://meshguides.org/guides/node/880> [Accessed 20 July 2018].

Crawley, J. (2016). *Pedagogy in Further Education and vocational Teacher Training*. Bath Spa University. MESHGuides <http://meshguides.org/guides/node/347> [Accessed 20 July 2018].

Department for Education (2016). *Educational Excellence Everywhere*. Available at: <https://www.gov.uk/government/publications/educational-excellence-everywhere> [Accessed 28 May 2017].

EFC (2016). *Making a difference to teacher quality - to ensure inclusive and quality education for all by 2020*. Global Summit Report, Education Futures Collaboration Charity. [https://docs.google.com/document/d/1W-IXytjGGG1PEYiL0v\\_oX3BtjK6MWXUrvYCdKseEL7c/edit#](https://docs.google.com/document/d/1W-IXytjGGG1PEYiL0v_oX3BtjK6MWXUrvYCdKseEL7c/edit#). [Accessed 20 April 2018].

EFC (2017) *A low cost 'Marginal Gains Strategy' to support SDG4 - engaging educators and aid agencies as 'change agents' to bring a step change in teacher quality*. MESHGuides. <http://www.meshguides.org/wp-content/uploads/2014/03/Summary-of-Marginal-Gains-strategy.pdf.pdf> [Accessed 20 April 2018]

Fagundes, T. (2016). Concepts of the teacher as researcher and reflective teacher: perspectives about teachers' work. *Revista Brasileira de Educação*, 21(65), pp.281-298.

Flynn, N., Mclean-Davies, L., Procter, R. and Younie, S. (2015). Mapping Educational Specialist knowHow (MESH): The Building of a Knowledge Management System. *Education Perspectives* (invited paper to academic journal of Sri Lanka, Ministry of Education), 4(1), pp. 4-22. (ISSN 2279-1450).

Flynn, N. 2018. "Facilitating Evidence-Informed Practice." Teacher Development. doi:10.1080/13664530.2018.1505649 [Accessed 20 July 2018].

Goldacre, B. (2013). *Building Evidence into Education*. Available at: <https://media.education.gov.uk/assets/files/pdf/b/ben%20goldacre%20paper.pdf> [Accessed 20 April 2018].

Gore, J. and Gitlin, A. (2004). [RE]Visioning the academic-teacher divide: power and knowledge in the educational community. *Teachers and Teaching: Theory and Practice*, 10(1), pp.35-58.

Harrison, C., Leask, M., Procter, R. and Younie, S. (2014). *Evaluating a resource for online teacher professional development across four continents: the MESH Guide to Spelling*. Paper presented at the European Conference on Educational Research as part of the symposium, 'Technology Enhanced Learning: Focusing on the teacher', September 2014, Porto.

Hammersley, M. (1993). On the Teacher as Researcher. *Educational Action Research*, 1(3), pp.425-445.

Hammersley M. (2001). Some Questions about Research informed Practice in Education. *Proceedings of the Annual Conference of the British Educational Research Association (BERA)*. University of Leeds, England. September 13-15, 2001. Available at: <http://www.leeds.ac.uk/educol/documents/00001819.htm>. [Accessed 23 May 2017].

Hammersley, M. (2002). *Educational research, policymaking and practice*. London: Paul Chapman Publishing.

- Hammersley, M. (2007). *Educational research and research informed practice*. Milton Keynes: The Open University.
- Hammersley, M. (2013). *The myth of research-based policy & practice*. London: Sage.
- Hempenstall K. (2006). Research informed practice in education: Why not? An update of: Hempenstall, K (2006). What does research informed practice in education mean? *Australian Journal of Learning Disabilities*, 11(2), pp.83-92. Available at: <http://www.aph.gov.au/DocumentStore.ashx?id=324387a8-60c3-414b-9cc2-2e5da8e32d8e>. [Accessed 24 May 2017].
- Hillage, J., Pearson, R., Anderson, A. and Tamkin, P. (1998). *Excellence in Research on Schools, Research Report RR74*, Department for Education and Employment (Sudbury, DfEE Publications).
- Hollingsworth, S. (1992). Teachers as researchers: A review of the literature. Occasional paper No. 142. The Institute for Research on Teaching, Michigan State University. Available at: <https://education.msu.edu/irt/PDFs/OccasionalPapers/op142.pdf>. [Accessed 10 January 2017].
- Horvath, J., Lodge, J. and Hattie, J. (2017). *From the laboratory to the classroom: Translating science of learning for teachers*. London: Routledge.
- Iredale, A., Stapleford, K., Tremayne, D., Farrell, L. Holbrey, C., Sheridan-Ross, J. (forthcoming 2018) *Social Media and Initial Teacher Training*. Technology and Pedagogy in Education Association (previously ITTE). MESHGuides.
- JET (2015) *Translational Research and Knowledge Mobilisation in Teacher Education* Vol. 41 No. 5. <https://www.tandfonline.com/toc/cjet20/41/5?nav=tocList> [Accessed 20 July 2018]
- Jones, S., Procter, R. and Younie, S. (2015). Participatory Knowledge Mobilization: An emerging model for translational research in Education. *Journal of Education for Teaching*, Special Issue, 41(5), pp.555-574.
- Jones, S. (2016). *Pedagogic shift - in international virtual schools*. University of Bedford: MESHGuides. Available at: <http://www.meshguides.org/guides/node/319> [Accessed 20th May 2018].
- Laird, K., Younie, Y. and Crosby, S. (2018). *Health Education - Primary Years*. De Montfort University.: MESHGuides. Available at: <http://www.meshguides.org/guides/node/729>, [Accessed 20th May 2018].
- Laxton, D. with the MESH Early Years Early Childhood Education Editorial Board (2018 a,b,c) see VSO.
- Leask, M.. and Jumani, N.B. (2015). MESH Pakistan: Prospects and challenges. *Journal of Education for Teaching*, 41(5), pp.586-596.
- Leask, M. and Younie, S. (2001). Communal Constructivist Theory: pedagogy of information and communications technology & internationalisation of the curriculum. *Journal of Information Technology for Teacher Education*, 10(1 & 2), pp.117 –134.
- Leask, M. and Younie, S. (2013). National Models for Continuing Professional Development: The Challenges of Twenty-First-Century Knowledge Management. *Journal of Professional Development in Education*, 39(2), pp.273–287.
- Leat, D., Lofthouse, R. and Reid, A. (2014). *Research and Teacher Education: The BERA/RSA Inquiry: Teachers' views: Perspectives on research engagement*. Available at: <https://www.bera.ac.uk/wp->

[content/uploads/2013/12/BERA-Paper-7-Teachers-Views-Perspectives-on-research-engagement.pdf](#)  
[Accessed 28 May 2017].

Livingston, K., Schweisfurth, M., Brace, G., Nash, M. (2017) *Why Pedagogy Matters: the role of pedagogy in Education 2030 - a policy advice paper*. University of Glasgow.  
<https://www.meshguides.org/news/> [Accessed 28 July 2018].

Malan Van Rooyen, M. (2018). *Coping Diversity*. University of Pretoria. MESHGuides.  
<http://meshguides.org/guides/node/1092> [Accessed 28 July 2018].

McIntyre, D. (2005). Bridging the gap between research and practice. *Cambridge Journal of Education*, 35(3), pp.357-382.

McLaughlin, C., Black-Hawkins, K. and McIntyre, D. (2004). *Researching Teachers, Researching Schools, Researching Networks: A Review of the Literature*. University of Cambridge Faculty of Education. Available at: <http://www.educ.cam.ac.uk/research/projects/super/ReviewOfLiterature.pdf>. [Accessed 28 May 2017].

McLean Davies, L., Dickson, B., Rickards, F., Dinham, S., Conroy, J. and Davis, R. (2015). Teaching as a clinical profession: translational practices in initial teacher education – an international perspective, *Journal of Education for Teaching*, 41(5), pp.514-528, DOI: [10.1080/02607476.2015.1105537](https://doi.org/10.1080/02607476.2015.1105537)

Mincu, M. (2013). *Research and Teacher Education: The BERA/RSA Inquiry: Teacher quality and school improvement: what is the role of research?* Available at: <https://www.bera.ac.uk/wp-content/uploads/2013/12/BERA-Paper-6-Teacher-Quality-and-School-Improvement.pdf>[Accessed 28 May 2017].

National Science Foundation, National Center for Science and Engineering Statistics. (2018). *Survey of Earned Doctorates, Table 66. Statistical profile of doctorate recipients in education fields, by sex and field of study: 2016*. Alexandria, VA. Available at: <https://www.nsf.gov/statistics/2018/nsf18304/datatables/tab66.htm> [Accessed 13th April 2018].

OECD (2000), *Knowledge Management in the Learning Society*. Paris. Organization for Economic Co-Operation and Development Publishing. Available at: [https://www.oecd-ilibrary.org/education/knowledge-management-in-the-learning-society\\_9789264181045-en](https://www.oecd-ilibrary.org/education/knowledge-management-in-the-learning-society_9789264181045-en). [ Accessed 18th May 2018].

OECD (2003). *Knowledge Management: New Challenges for Educational Research*. Paris. Organization for Economic Co-Operation and Development Publishing.

OECD (2007). *Evidence in Education: Linking Research and Policy*. Paris. Organization for Economic Co-Operation and Development Publishing.

OECD (2009). *Creating Effective Teaching and Learning Environments: The First Results from the TALIS Survey*. Available at: <http://www.oecd.org/edu/school/43023606.pdf>. [Accessed 18th May 2018].

OECD (2010). *The Nature of Learning: Using Research to Inspire Practice*. Paris: Organization for Economic Co-Operation and Development Publishing.



Ovenden-Hope, T. and la Velle, L. (2015). Translational research in education for knowledge mobilisation: a study of use and teacher perception in primary schools in England, UK, *Journal of Education for Teaching*, 41(5), pp.574-585, DOI: [10.1080/02607476.2015.1105541](https://doi.org/10.1080/02607476.2015.1105541)

Poultney, V. (2017). *Research informed teaching in primary education*. St. Albans: Critical Publishing.

Procter, R. (2014). *Teaching as an Evidence Informed Profession: Knowledge mobilisation with a focus on digital technology*. Unpublished PhD thesis, University of Bedfordshire.

Procter, R. and Younie, S. (forthcoming, 2018). *International perspectives in the MESH Guides approach: A survey for the UNESCO Teacher Task Force*. Technology, Pedagogy and Education.

REF (2015). *Research Excellence Framework 2014: Overview report by Main Panel C and Sub-panels 16 to 26*. Available at: <https://www.ref.ac.uk/2014/panels/paneloverviewreports/> [Accessed: Apr 2018].

Rosenberg, J.F., Turner, R., Underwood, A. and Whyte, S. (2016). MESH Guides - Translational Research in Deaf Education Practice. *International Journal of Technology and Inclusive Education (IJTIE)*, Volume 5, Issue 2, December 2016

Shrestha, P. K. 2018. "Home Based Early Childhood Care and Education for Rohingya Children in Jamtoli Camp, Bangladesh." A paper presented at the UNESCO International Symposium "Early Childhood Care and Education: Cradle for Social Cohesion", UNESCO, Paris, 2018 March 5-6.

Shulman, L. (1987). Knowledge and teaching: foundation of a new reform. *Harvard Review*, 57: 1–22.[2] see also <http://www.meshguides.org/professional-knowledge/>.

Simon, B. (1981). 'Why no pedagogy in England?' in B.Simon and W.Taylor (eds) *Education in the Eighties: the central issues*. London: Batsford

Stewart, W. (2015). Leave research to the academics, John Hattie tells teachers. *TES.Tes Global*. Available at: <https://www.tes.com/news/school-news/breaking-news/leave-research-academics-john-hattie-tells-teachers> [Accessed 28 May 2017].

UNESCO (2015). *Incheon Declaration and Framework for Action for the implementation of Sustainable Development Goal 4*. Paris: UNESCO. Available at: <http://unesdoc.unesco.org/images/0024/002456/245656E.pdf> [Accessed 28 May 2017]

VSO (2017). *Annual Report 2016/2017*. London: Voluntary Service Overseas. Available at <https://www.vsointernational.org/sites/default/files/annual%20report%202016-17.pdf> [Accessed 29 May 2017].

VSO and MESH Early Years Early Childhood Education Editorial Board (2018a under development). *Early Childhood Care and Education in Emergencies MESHGuide* <http://meshguides.org/guides/node/994> [Accessed 29 July 2018].

VSO and Laxton, D. with MESH Early Years Early Childhood Education Editorial Board (2018b). *Family booklet for early childhood education in emergencies* (ECEE). VSO/MESH.(also available in Burmese and Bengali).

VSO and Laxton, D. with MESH Early Years Early Childhood Education Editorial Board (2018c). *Volunteers/play leader's booklet for early childhood education in emergencies* (ECEE) . VSO/MESH.

VSO and Kirby, F. (2018d). *ECCE Curriculum to accompany Family booklet for early childhood education in emergencies (ECEE)*. VSO/MESH.

Wiliam, D. (2002). Linking research and practice: Knowledge transfer or knowledge creation? *Annual Meeting [of the] North American Chapter of the International Group for the Psychology of Mathematics Education*. 24th, Athens, GA.

Wiliam, D. (2015). The research delusion. *Times Educational Supplement*. TES Global. Available at: <https://www.tes.com/news/tes-archive/tes-publication/research-delusion> [Accessed 28 May 2017].

Wittgenstein, L. (1922). *Tractatus logico-philosophicus*. London, Routledge & Kegan Paul.

Younie, S. and Leask, M. (2013). *Teaching with Technologies: The Essential Guide*, Maidenhead:Open University Press.

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