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Literature Review

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Perspectives on Knowledge into Action in Education and public service reform: A review of relevant literature and an outline framework for change

Christopher Chapman, Stuart Hall, Kevin Lowden and Natalie Watters

Contact: chris.chapman@glasgow.ac.uk



What Works Scotland (WWS) aims to improve the way local areas in Scotland use evidence to make decisions about public service development and reform.

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- learn what is and what isn't working in their local area
- encourage collaborative learning with a range of local authority, business, public sector and community partners
- better understand what effective policy interventions and effective services look like
- promote the use of evidence in planning and service delivery
- help organisations get the skills and knowledge they need to use and interpret evidence
- create case studies for wider sharing and sustainability

A further nine areas are working with us to enhance learning, comparison and sharing. We will also link with international partners to effectively compare how public services are delivered here in Scotland and elsewhere. During the programme, we will scale up and share more widely with all local authority areas across Scotland.

WWS brings together the Universities of Glasgow and Edinburgh, other academics across Scotland, with partners from a range of local authorities and:

- Glasgow Centre for Population Health
- Healthcare Improvement Scotland
- Improvement Service
- Inspiring Scotland
- IRISS (Institution for Research and Innovation in Social Services)
- Joint Improvement Team
- NHS Health Scotland
- NHS Education for Scotland
- SCVO (Scottish Council for Voluntary Organisations)

This Literature Review is one of a series of papers that What Works Scotland is publishing to share evidence, learning and ideas about public service reform. This paper relates in particular to the WWS **Evidence into Action** work stream.

Professor Christopher Chapman is Chair of Education and Public Policy and Practice, and Director of the Robert Owen Centre for Educational Change, University of Glasgow.

Stuart Hall is a research Officer for the Robert Owen Centre for Educational Change, University of Glasgow.

Kevin Lowden is a research Officer for the Robert Owen Centre for Educational Change, University of Glasgow.

Dr. Natalie Watters is a post-doctoral Research Assistant for the Robert Owen Centre for Educational Change, University of Glasgow.

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1. Introduction

Knowledge mobilisation is a major challenge for education systems around the world and this has been recognised as an important task for Education Scotland, the Scottish Government and those concerned with public sector reform. This paper is a joint working paper bringing together ideas from What Works Scotland and the Robert Owen Centre for Educational Change at the University of Glasgow. The paper presents a literature review on what works in Knowledge into Action in Education including an examination of evidence-based models that support the effective translation of knowledge within the Scottish Education system. Although this paper has a particular focus on building capacity to support Education Scotland's role as the national improvement agency for education some of its findings are applicable more broadly across public service reform in Scotland.

This review is structured in five further sections, exploring four questions and offering a commentary. The questions are:

- What is knowledge into action?
- What do we know about knowledge into action in education?
- What are some of the challenges associated with knowledge into action?
- What frameworks might help us to understand knowledge into action better?

The concluding commentary offers some reflections on the field and presents a potential model to be tested and refined as the fieldwork dimension of this project develops. Appendix 1 presents the methods used to undertake the review.

2. What is knowledge into action?

McKibbin et al. (2010) identified more than 100 terms for research 'usage' which may contribute to the confusion about defining and understanding *knowledge into action*. In an attempt to address these issues it is important to clarify that 'knowledge' in this context is not only academic evidence from peer reviewed journals; it can also cover evidence from other sources, such as inspection evidence and accounts of good practice. Knowledge into action is also often used interchangeably with other associated terms, including *evidence in practice*, *knowledge transfer*, *knowledge mobilisation* and *knowledge exchange*. These terms are generally used to describe initiatives that attempt to bridge the world of research and knowledge and the world of practice so that there is continued effort to improve the way things are done (Scottish Government, 2012). Mitton et al. (2007) suggest that, as thinking has moved on, the concept of *knowledge transfer* is less commonly used because it denotes one-way communication. Mitton et al. argue that the concept of *knowledge*

exchange is better aligned with the dialogical process which should be taking place between knowledge user and knowledge producer.

For the UK in particular, the evidence-based practice agenda continues to be a key issue in health, education and social care. However, as Nutley and colleagues remind us:

despite widespread discussion and numerous activities to promote evidence-based practice, there are concerns about progress and the best way forward'

(Nutley, et al., 2009: 552).

A wide range of initiatives exist that aim to improve the use of research by practitioners delivering public services, many of which have been initiated under the demand for *evidence-based practice* (Nutley et al., 2007). Rütten and Gelius (2014) argue that it is vital for practitioners, in their case allied health professionals, to engage with research and draw from new innovations and tested interventions in order to improve their practice. Rütten and Gelius are keen to point out that developing an evidence based practice is part of capacity building for professionals. Kislov et al. (2014) add that, when practitioners fully engage in the knowledge mobilisation process they acquire knowledge and skills but, more importantly, they develop an enquiring mindset.

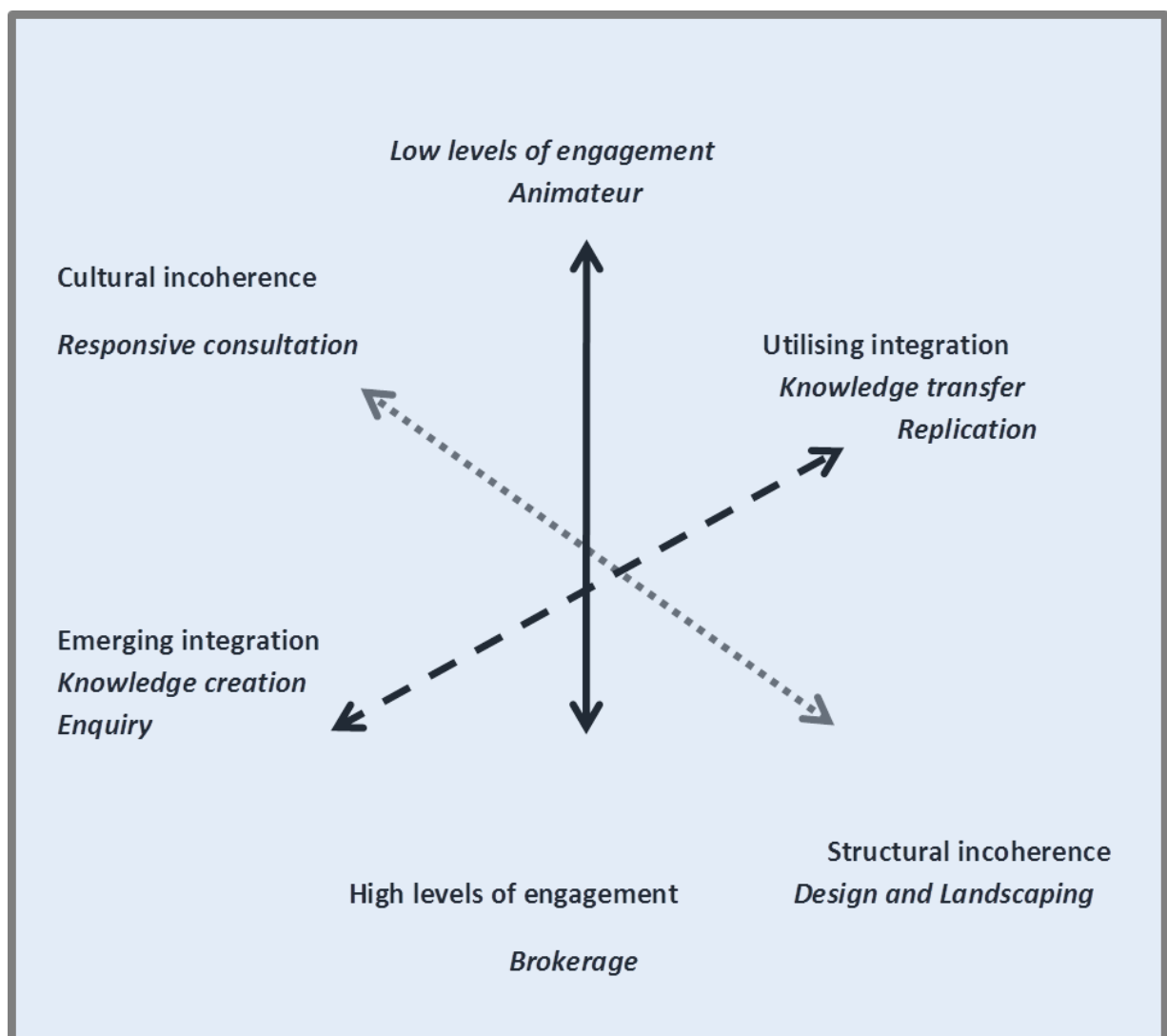
Currently, much of the best evidence of effective knowledge into action, particularly in Scotland, comes from the health care field (for example, Dopson and Fitzgerald, 2005; Nutley et al., 2009; Scottish Government, 2005; Straus et al., 2013; World Health Organization, 2007), social services (Scottish Government, 2012) and the private sector (Pfeffer and Sutton, 2013)).

There is debate regarding whether and how literature from the field of health can be used and adapted in the context of education. Marsh (2005) advocates that lessons can be learnt from medicine's Cochrane Collaboration, a unique, worldwide organisation that prepares and maintains systematic reviews of the effects of healthcare interventions (Grimshaw et al. (2006)). Grimshaw et al. suggest that the products of the Cochrane Collaboration provide a unique resource for practitioners who use evidence to support decision making. Like Marsh (2005), the Department for Education (2013: 8) argue that there are 'sufficient similarities' between the two to make it possible for education to learn from medicine. The DfE (2013: 8) suggests that both medicine and education involve 'craft and personal experience' and finding out 'which strategies should be tried first ... to help everyone achieve the best outcome'.

Weiss (1979) argues that the early work on research / knowledge into action lay within the natural sciences. In this context, the knowledge into action process follows a linear, almost instrumental, path; knowledge is discovered through basic research and the research is developed and then applied. However, in other areas, such as public services' development, the process would appear to be more problematic and challenging. Lomas (2000) suggests

that part of the problem of delivering effective knowledge into action lies in the different cultures surrounding those doing research and those who might be able to use it. Chapman and Hadfield (2010) highlight the cultural challenges and different approaches adopted by those tasked with supporting coherence and capacity building across children's services, moving knowledge into action, during a two-year project involving 19 Local Authorities in England. The heuristic presented offers a way of thinking about how middle tier actors, such as local authorities, school districts and academy chains adopt different approaches within a networked system to move knowledge into action.

Figure 1: A heuristic for considering 'middle tier' approaches to strategically developing greater coherence and integration within a networked system



(Chapman and Hadfield, 2010: 241)

The heuristic reflects how a range of factors can affect the choice of strategies used to influence more networked public service provision. The nature of the strategies relates

closely to how knowledge is moved into action for each context.

For example, where there are high levels of engagement, brokerage is favoured and where there are low levels of engagement strategies tend to focus on animateur'ship'- organising the knowledge and engaging actors in an attempt to filter information and enhance understanding. Where there is a high level of structural incoherence strategies tend to focus on 'designing and landscaping' – putting structures in place to support effective communication and knowledge management. In contrast, where cultural incoherence is an issue, strategies tend to focus on responsive consultation through meaning making to create a shared understanding. In settings with emerging integration the focus tends to be on developing enquiry-based approaches to generate knowledge whilst in settings where the focus is utilising integration, knowledge transfer through replication strategies tends to prevail. These continua, representing a range of contextual conditions, highlight the complexity associated with knowledge into action and the importance of understanding and paying attention to specific contexts. Furthermore, the framework acts as a useful reminder as to which strategies might be more closely aligned to specific contextual conditions.

Morton and Flemming (2013) also highlight the complexity of the process of translating knowledge into action within the social sciences. Morton and Flemming (2013: 4) argue that research:

'contributes to outcomes rather than being the direct cause of change' and that, 'unlike technological or scientific developments, social science findings cannot drive change on their own'.

Morton and Flemming argue that this is the case because in the context of social sciences, research contributes to *'change through dialogue and interaction' rather than direct implementation* (2013: 4) and they also advocate using the term 'research contribution' rather than 'research impact' as the former aligns better with the complex ways in which research is used.

Nutley et al. (2009) discuss the different approaches to research use. The instrumental approach, much like that outlined by Weiss (1979), follows a linear trajectory in that knowledge / research evidence exists and is applied to solve a certain problem. The non-instrumental approach is much more complex and concerned with changing and challenging thinking; this approach pays attention to conceptual impact. Nutley et al. (2009: 553) argue that *'at the very least, there is a need to consider how research reshapes understanding as part of the process of generating receptivity to evidence-based practices'*.

Ward et al. (2009) suggest that instead of focusing on the evaluation of knowledge transfer interventions, literature to date has tended to focus on theories, models or frameworks of the knowledge transfer process. Like Lomas (2000), Ward et al. (2009) argue that one of the major difficulties with deterministic / instrumental approaches to knowledge transfer is that

they presume that both the knowledge itself and the contexts in which it is implemented are uniform and tend not to acknowledge the complexity of the process. In order to advance the theory and practice of knowledge into action, there has to be a move away from *'narrow descriptions of knowledge transfer towards a broader sociological explanation of the process, testing the adequacy of alternative models of knowledge transfer, and refining and testing tools for designing and evaluating interventions'* (Ward et al., 2000: 3).

3. What do we know about knowledge into action in education?

Specific literature which discusses knowledge into action in the context of education in the UK is scarce. This is not to say that educators are not using knowledge and evidence to inform their practice, but documented evidence of it is not widely published. Over the past two decades, there has been a range of different *knowledge mobilisation* and *knowledge into action* initiatives in education. However, as argued by Goldacre (2013) the use of evidence in educational practice remains limited. This point is reiterated by Rickinson (2005) who, reviewing studies of teachers' use of research highlighted that empirical data showed that teachers regularly consult and use research. However, it was later revealed in more detailed studies that their engagement with research was in fact often limited and lacking in depth (Rickinson, 2005).

Evidence from the Education Endowment Foundation (2014) suggests that teachers who took part in an action research project to improve feedback to pupils, struggled to engage with academic literature that could inform their practice. The report, produced by Durham University researchers, says that the teachers found it difficult to understand how best to use the literature and how it was relevant to the reality of what they did on a daily basis in the classroom. Barriers to research informed practice were highlighted in a study conducted by Harding et al. (2014) which stated that, in the field of medicine, practitioners had positive attitudes to what they called Evidence Based Practice (EBP), but there was still low participation in any EBP activities. Harding et al. suggested that lack of skills and resources were common barriers for medical practitioners, as was their professional culture and the constant pressure for quick patient turnarounds. In education, similar 'barriers' were mentioned by Mitton et al. (2007: 737) who presented a list which included: lack of experience and capacity for assessing evidence; negative attitude towards change; unsupportive cultures and traditional, academic language. Mitton et al. and Gray et al. (2013) suggest that in order to overcome some of these barriers there must be institutional and cultural change at both an individual and an organisational level.

Judkins et al. (2014) provide a comprehensive example of knowledge into action in the context of education. In this particular study, data was collected from schools in the United Learning Schools Scheme in England. Seven case study schools were selected, each of which was using research to inform practice. The perceived benefits of using research were

outlined as: encouraging more deep reflection on teaching practice; challenging thinking; providing new and innovative ideas to inform teaching and learning and encouraging teachers to look beyond school and gain a wider perspective. The perceived benefits to learners were: improved achievements and attitude; teachers creating more varied and innovative lessons and learners being more engaged. Judkins et al. (2014) conclude that evidence informed practice is in its inception and that evidence is patchy and dependent on individuals' enthusiasm. One main conclusion of the study was that teachers are more likely to engage with research if they are practitioner researchers themselves.

Much literature exists which discusses the conceptualisation of knowledge into action and (Ward et al., 2009).argue that there are not many concrete examples of it in the context of education, especially in Scotland. There are some useful examples of knowledge into action from the field of health. For example, Bywood et al. (2009: 206) discuss *'efforts to bridge the gap between discovery of innovations and their adoption in practice ... to support best practice'*. Bywood et al. suggest that there is a role for so-called practitioner 'champions' or 'brokers' who form 'linking relationships' to help diffuse and facilitate the flow of new information. Harris et al. (2011: 9) discuss the operation of 'journal clubs' in the medical field where opportunities are created for practitioners to discuss and make sense of research evidence. Harris et al. (2011: 10) argue that these journal clubs allow practitioners to come together and *'discuss and make sense of new knowledge' which is a 'critical component in transferring and applying knowledge in the workplace'*.

There has been an international trend (particularly in the UK, the Netherlands and Canada) to invest in 'research broker' organisations that bridge the gap between research, policy and practice in the public sector (Howard, 2005; Smith, 2013). This has been particularly evident in education, where the various systems across the UK and beyond have experimented with a number of agencies taking responsibility for bridging in different parts of the system, for example the Centre for the Use of Research and Evidence in Education (CUREE) in Coventry and The Iterative Best Evidence Synthesis (BES) programme in New Zealand. In Scotland, Education Scotland's Corporate Plan explicitly seeks to develop its capability for knowledge mobilisation. This is a key function for any leading improvement agency and in achieving this Education Scotland will act as the education service's primary bridge between research, policy and practice to support the improvement of outcomes within the system.

4. What frameworks might help us to better understand knowledge into action?

Nutley and colleagues argue: *'Too much discussion about evidence-based practice occurs in sector silos, whereas there is much to be learned from looking across sectors.'* (Nutley, et al., 2009: 552). In order for knowledge into action practices in education to develop, we must draw on the existing literature from education as well as wider literature from health care

and social services. It would be helpful to use the frameworks and models which have already been identified as good practice in these other fields so that appropriate conditions are created in the context of education to support effective knowledge mobilisation.

Ward et al. (2009) identified five common components of the knowledge transfer process: (1) problem identification and communication; (2) knowledge/research development and selection; (3) analysis of context; (4) knowledge transfer activities or interventions; (5) knowledge/research utilisation. Similarly, Nutley et al. (2009: 558) suggest that there are five key mechanisms which underpin existing strategies aimed at promoting research use, these are: 'dissemination; interaction; social influence; facilitation; and incentives and reinforcement'. Existing evidence on the individual effectiveness of these mechanisms suggests that interactive approaches show most promise in improving the use of research. However, most progress is likely to be made through multifaceted strategies that combine two or more mechanisms (Nutley et al., 2009)

Working in the context of the health sector, Davies et al. (2011) brought together 16 different frameworks of knowledge into action to help support NHS Scotland to develop a new model. Davies et al. (2011) divided these 16 frameworks into two categories; Implementation Frameworks and Interactional Frameworks. Implementation Frameworks focus on the implementation of well-defined, codified knowledge e.g. clinical guidelines. Interactional Frameworks focus on social knowledge and learning about how to change practice.

The knowledge into action model proposed by Graham et al. (2006) (see Figure 2), is highlighted by Davies et al. (2011) as an example of an Implementation Framework. This framework suggests that the knowledge into action process is iterative, dynamic and complex. It is concerned with both the creation and the application of knowledge.

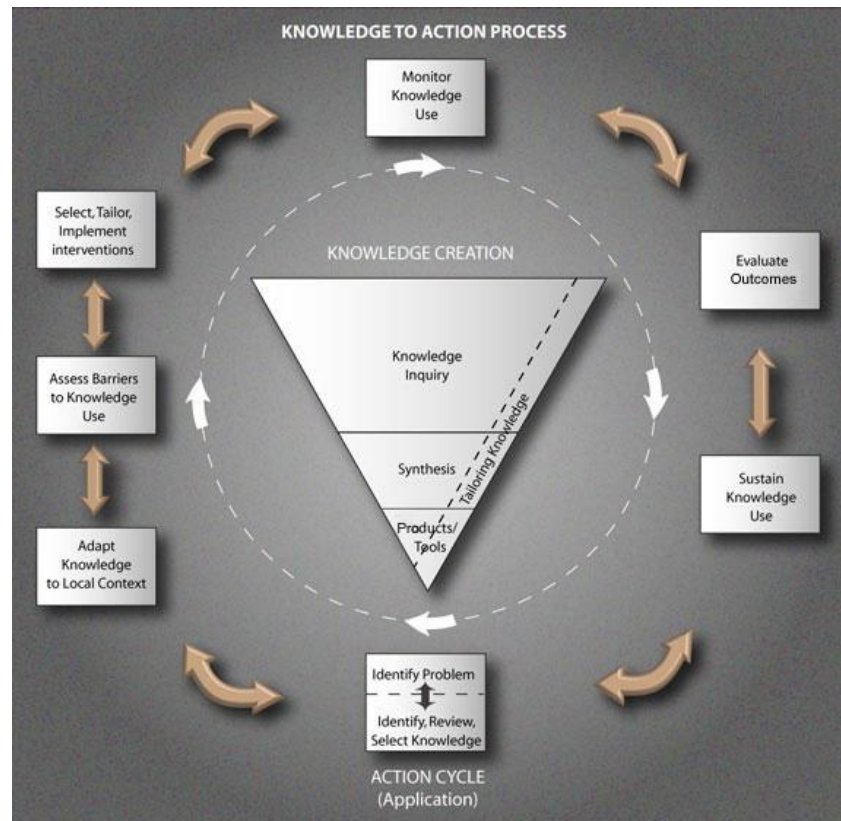


Figure 2: Knowledge to action process, Graham et al. (2006)

Graham et al.'s (2006) example is a useful one to draw on because it highlights the complexities involved when implementing knowledge into action. It is a conceptual framework with two overlapping phases of knowledge translation; knowledge creation (where knowledge is filtered to make it more useful) and the action cycle.

An example of an Interactional Framework, is the model proposed by Ward et al. (2010) (see Figure 3).

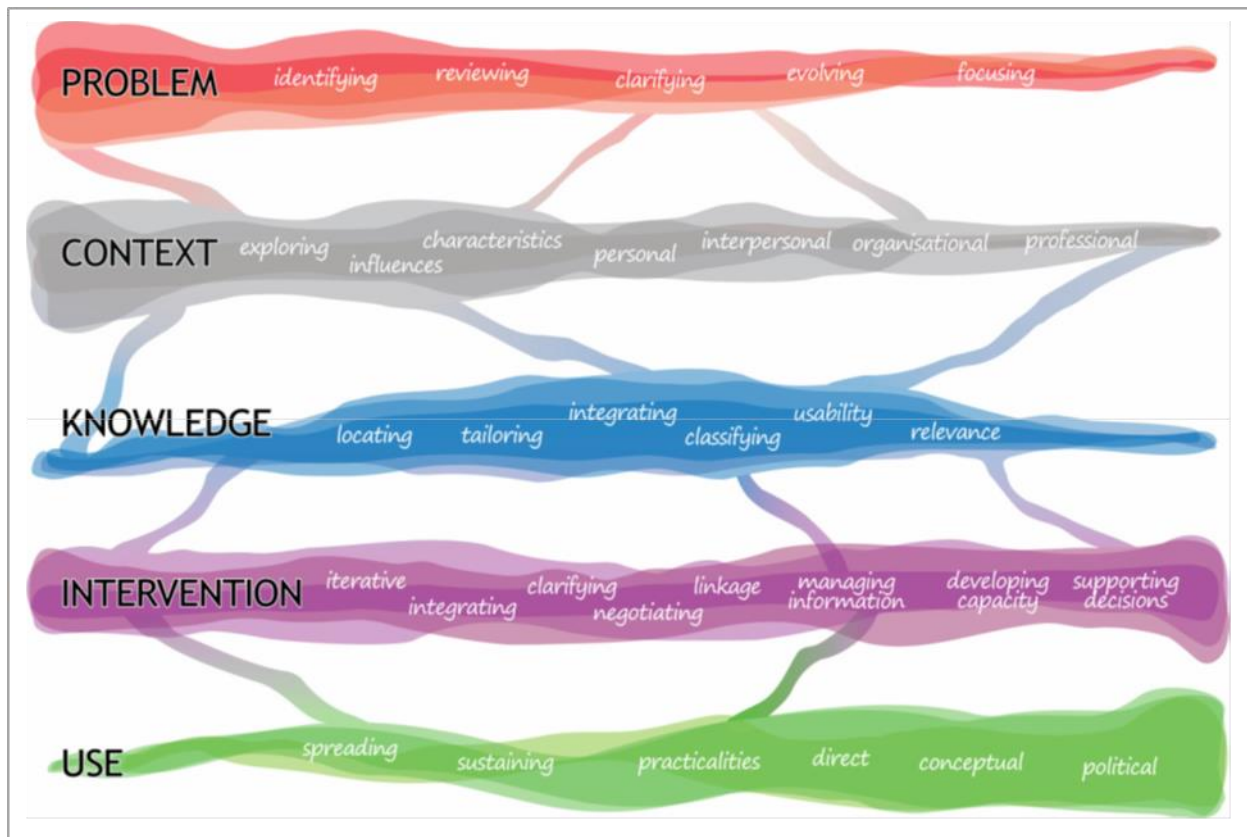


Figure 3: Knowledge Transfer Process Model, Ward et al. 2010

This model identifies five crucial elements of the knowledge transfer process and, helpfully, both the producers and the users of research are included in this model. This model represents a clearer understanding of the processes involved in transferring knowledge into action which could serve as a template for planning and evaluating specific knowledge transfer activities. Ward et al. (2010) advocate it as a useful model which provides guidance on how to undertake and assess the knowledge transfer process. However, the difficulty with this model is that it appears to present knowledge into action as a rigid set of tasks and activities. Ward et al. themselves argue that knowledge into action is an iterative process which must have degrees of flexibility and be something that knowledge users and producers can return to at various points. Unfortunately, this model does not appear to show the complex, cyclical nature of knowledge into action.

Rickinson's (2005) review of teachers' uses of research highlights a similar diversity and complexity of ways in which evidence can have an influence. He notes that teachers use research in active and selective ways, which depend on and inform their own values and experiences. Rickinson's review found that teachers had used research in multidimensional ways; they had drawn on it to improve their practice as well as more broadly in designing their methods and curricula. They had also used research to find ways to deal with specific problems. Rickinson (2005) argues that, for teachers, research use is not just about what happens in the classroom, it also reflects the varied professional roles that they hold, 'as

planners, thinkers, leaders, coaches, researchers and learners' (Rickinson, 2005: 23). Rickinson (2005) identified five different processes that help us understand how individual practitioners engage with research:

(1) An active process	Teachers actively engage with the concepts and findings from research. Research will be adapted and translated, given meaning within the local contexts of its use, rather than simply adopted. This might involve working collaboratively with researchers and other practitioners as well as teachers themselves undertaking research.
(2) A selective process	Teachers engage with research in individualised, subjective and idiosyncratic ways. Their response to research will vary and their use of research reflects both their practical needs and their unique ways of thinking.
(3) A values-rich process	Teachers use research where it fits their own personal values and beliefs. Evidence alone is not enough: research use is often an emotional, not simply instrumental, process.
(4) A rewarding process	Teachers also use research to make sense of their own experiences, and view engaging with research as a learning process. They share and discuss research with colleagues as well, weighing up new results and new ideas.
(5) A developing process	Teachers may change the ways in which they use research across the course of their professional careers. Among newly qualified teachers, individualised appraisal of research is common. Mid-career, teachers extract research findings from their contexts in order to apply them. In the final, established phase of their careers, teachers are more likely to experiment with the findings from research.

5. What are the some of the challenges associated with knowledge into action?

In the context of education, it has been argued that it is unrealistic and impractical to expect teachers to engage with research on top of an already hectic and demanding teaching schedule (Trinder and Reynolds, 2000). Furthermore, Nutley et al. (2007) state that much of the early literature on evidence-based practice made rather naïve assumptions that there were stocks of knowledge (mainly in the form of research and evaluation evidence) on the one hand, and potential users of this knowledge (in the shape of practitioners) on the other.

This position draws on many of the assumptions that underpin the early work in this area within the natural sciences.

The dissemination / instrumental model of knowledge into action has been criticised as being overly simplistic and unrealistic and ineffective in capturing the complexities of what happens when evidence influences practice (Hammersley, 2001). Furthermore, Dopson and Fitzgerald (2005) argue that much attention has to be paid to the active role of context when investigating the process of knowledge into action. They propose that research evidence does not travel well; that it is '*sticky at professional boundaries*' and that '*knowledge may diffuse within different communities of practice but stick where practice is not shared*' (Dopson and Fitzgerald, 2005: 188).

Some of the other challenges to consider are related to ethical considerations and values. Said (1994: 83) argues that by focusing on what works, ethical considerations such as 'why one does it and who benefits from it' are neglected. According to Kreber (2013) and Sanderson (2003) the inclusion of ethical considerations and values presents a challenge to evidence-based practice. Kreber (2013) argues that '*the discourse of evidence based practice does not invite questions about the desirability of the ends ... but is concerned solely with the effectiveness of means for pre-determined ends*'. Similarly, Sanderson (2003) suggests that practical wisdom relies heavily on tacit knowledge which is grounded in experience and this knowledge (in the context of professional practice) usually occurs within a '*normative framework of values, rules ... and conventions*'. Sanderson (2003: 342) argues that because of these '*values and rules*' ... '*decision making and action are as much a matter of obligation as they are rational analysis*'.

There was lengthy discussion around the challenges of effectively implementing knowledge into action amongst the cross-sector professionals at the *What Works Scotland* Knowledge into Action roundtable event on 6 October 2014 in Edinburgh. (WWS - 'Getting evidence into action to improve Scotland's public services') Amid the discussion, several challenges in putting knowledge into action were highlighted such as: who has the power to make change, tensions between evidence and innovation and just how important context is when trying to implement change (see Appendix 2 for full list). The range of perspectives relating to knowledge into action highlights the complexity and the contested nature of the terrain. As we have highlighted, this operates at various levels and in different spaces, from understanding the key terms and definitions to the practical attempts at moving knowledge around the system. In the final section we offer a number of initial conclusions and recommendations based on the literature we have engaged with.

6. Commentary

The limited quantity of literature specifically relating to knowledge into action in education illuminates the urgent need for further work in this area. This is compounded by the emerging trend of applying knowledge and understanding across service boundaries. While there is much to be learned, and other sectors can offer useful insights and new perspectives, caution must be applied when borrowing frameworks that are designed for a specific context underpinned by a distinct set of professional values and beliefs. For example, many of the illustrations of knowledge into action come from the field of healthcare, which has a specific approach to research and a specific perspective on its use and translation into action. Ozga (2007: 63) suggests that there is a policy push to make research based knowledge more responsive to the growing information needs of users instead of it becoming '*trapped in disciplinary silos*'. However, education is underpinned by a differing set of values and beliefs that lead to certain assumptions about the nature of the teaching and learning process which are quite distinct from effective processes associated with medical healthcare. As Mitton et al. (2007) helpfully remind us, there is not one 'off the shelf' set of recommendations for developing or recommending knowledge into action strategies. Instead, it may be more helpful to consider the adaptation rather than the adoption of existing models of knowledge into action. For some aspects it is clear that a rethinking of the task in hand is required rather than slavishly adopting, or even subtly adapting, approaches from other disciplines.

Caveats aside, the knowledge into action model proposed by Graham et al. (2006) (Figure 2) might be useful and informative for use in an educational context. This model emphasises the complex nature of knowledge into action and highlights the importance of knowledge creation, local context and sustainability of evidence use.

Rickinson's (2005) five processes (active, selective, values-rich, rewarding, developing) may serve as a useful starting point for understanding how and why teachers and other professionals engage with evidence informed practice. For effective knowledge mobilisation in education and in other professional spheres, there must be a tailored approach which fits with the values and professional identity of practitioners. For instance Community Learning and Development practitioners registered with the CLD Standards Council have a number of competencies, including 'Evaluate and Inform Practice' which encompasses the use of research.

If teachers and other professionals are to continue to develop and expand the incorporation of evidence into their practice there must be adequate time spent on identifying what the benefits are in order for there to be significant 'buy in'.

One issue which may warrant further exploration is the idea discussed by Judkins et al. (2014) that teachers must see their professional identity as including a practitioner research

role and embracing collaborative enquiry in order to promote knowledge into action. The notion of collaboration is a consistent theme in the literature. For example, Campbell (2010), Colucci-Gray et al. (2013) and Cordingley (2008) all highlight the importance of collaboration for effective and sustainable knowledge transfer systems. Each of these authors argues that translating research knowledge into action effectively requires all participants to be involved in the process. Similarly, Jackson (2007) explores the importance of networks in stimulating innovation and facilitating knowledge transfer and the development of 'Networked Learning Communities' in which practitioners form partnerships of learning which enable research to be successfully translated so that they meet the needs of their context. Furthermore, Gray et al. (2013) argue that knowledge which is co-produced is more likely to be applied by stakeholders in their context. However, Brown and Rogers (2015) sound a note of caution by highlighting that if practitioners are expected to use evidence to inform their decision making, then the research must be made accessible for them. This appears to be a persistent challenge, particularly in education, in terms of access to journal and other publications.

Colucci-Gray et al. (2013), Ferlie et al. (2012) and Hart et al. (2013) stress that collaboration has to be characterised by genuine equity across stakeholders regarding their roles and responsibilities in the knowledge mobilisation process. Where the process is equitable and democratic, practitioners are more likely to become empowered in general as well as more able to draw on research evidence. Gainforth et al. (2014) and Smith et al. (2013) highlight the importance of interpersonal communication, emotional intelligence and quality of relationships for successful and effective translation of knowledge into action. Gainforth et al. also argue that practitioners who are more fully involved in the process are more likely to adopt evidence based behaviours.

In light of the discussion around 'broker agencies' in the development and implementation of knowledge into action, and like the Cochrane Collaboration in health, the work of the 'Centre for the Use of Research and Evidence in Education' (CUREE) in Coventry and The Iterative Best Evidence Synthesis (BES) programme in New Zealand may be useful sources from which to draw. CUREE claims to encourage teachers to develop evidence informed practice by working as a brokering agency between research makers and potential research users. CUREE aims to make research and evidence useful and attractive for practitioners. The Centre also claims to help school leaders to decide on cost effective approaches through knowing what really works and to increase the interest and skills of practitioners in their own classroom enquiries.

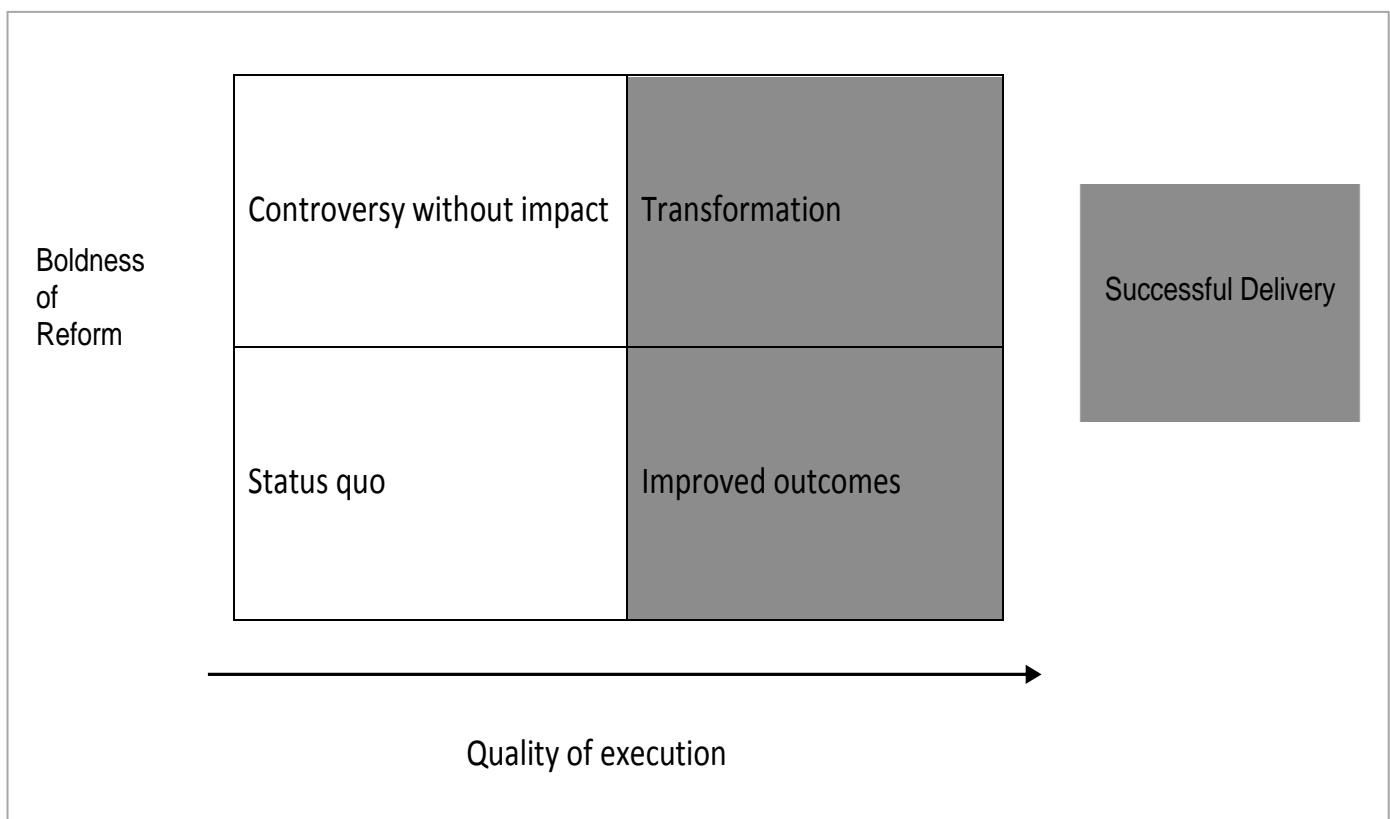
The Iterative Best Evidence Synthesis (BES) Programme is a knowledge brokerage innovation situated within a national policy context in the New Zealand Ministry of Education (Best Evidence Synthesis Programme, 2012). The principle that drives the BES approach is that fit-for-purpose approaches are needed in the development and use of trustworthy knowledge

for improvement. The Iterative Best Evidence Synthesis (BES) Programme brings together research-based evidence, from New Zealand and elsewhere, to explain what works and why in education and what makes a bigger difference for diverse learners (specifically in this context, Maori pupils). The BES produces professional resources for educators, policy workers, researchers and trustees. BES findings are brought to life through vignettes and cases of effective practice.

One consideration for further exploration is the development of a similar approach at local, regional or national levels in Scotland in which a ‘broker’ agency or organisation is located within an innovation hub which actively seeks to select, condense and make available appropriate research to educationalists and those with an interest in public sector delivery.

An alternative perspective that is helpful in terms of thinking about knowledge into action is the *systems reform* approach outlined by Barber (2008). In conceptualising service delivery, Barber argues that ‘transformation’ rather than ‘improvement’ is achieved through the boldest of reforms, executed with the highest quality implementation while ‘improvement’ is achieved through safe reforms implemented with high quality execution. In contrast, Barber argues, bold reforms that are poorly implemented lead to ‘controversy without impact’ and safe reforms, poorly implemented lead to reinforcing the ‘status quo’.

Figure 4: System reform and successful delivery



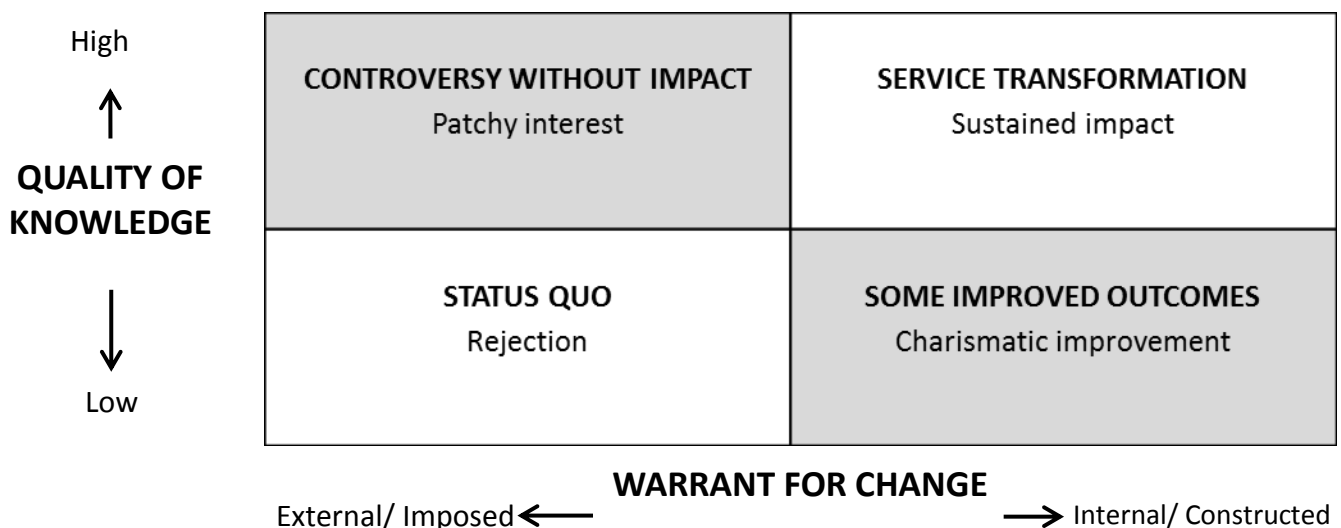
(Barber, 2008: 83)

If we build on Barber's rationale, and take a knowledge into action perspective by rethinking 'boldness of reform' as 'quality of knowledge' and 'quality of execution' as 'warrant for change' we begin to see the potential for knowledge into action to become a driver for system reform. Knowledge that is underpinned by high levels of evidence and widespread credibility – *high quality knowledge* – offers the potential for systemic transformation, while knowledge that is underpinned by low levels of evidence and limited credibility – *low quality knowledge* – offers the potential for systemic improvement rather than transformation.

Turning our attention to the *process* of moving knowledge into action. If we consider this in terms of a 'warrant for change', we argue such a warrant that is mandated externally and imposed and considers knowledge as an 'object' to be transmitted, this will limit the extent to which knowledge can be transferred to action. Even when high quality knowledge is subjected to this process we see only patchy interest by leading parts of the system that can see the value in engaging with 'high quality' knowledge even although it is externally mandated and transmitted into a particular setting. For most within a system, the nature of the process will limit access the high quality knowledge, resulting in patchy interest and controversy without impact. At worst, an external/ imposed warrant will lead to rejection of the knowledge and maintain the status quo.

In contrast, if we think about a process whereby the warrant for change is internal and knowledge is 'constructed' through interaction and developed as a social process. In this situation, even when transferring low quality knowledge will lead to 'some improved outcomes', with the reform catching the zeitgeist as 'charismatic improvement'. However, when 'high quality knowledge' is transferred through an internal warrant that is constructed this will lead to 'service transformation' with sustained impact across the system. The knowledge into action matrix for system reform is as follows:

Figure 5: Knowledge into Action for System Transformation



We propose that this framework for change should provide the basis for mapping current and emerging knowledge to action projects. This will serve to test the robustness of the framework and provide a mechanism for thinking about the contribution, success, spread and depth of various initiatives. We also recommend that the framework be further developed as a heuristic to guide future decision-making relating to the knowledge into action. We believe there is merit in exploring the viability of developing this into a full, explanatory model. This exercise will begin to test the validity of the framework, deepen our understanding of how knowledge into action is developing in educational settings and also to assess the potential for the knowledge into action workstream to support and guide systemic reform.

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Appendices

Appendix 1 - Methodology of Literature Review

A systematic review method was adapted and used for locating and synthesising the evidence presented in this literature review. The method, which is informed by a 'best evidence' approach (Slavin, 2008), generates comprehensive, criterion-based analysis of the available literature and utilises a robust, consistent method in retrieving, appraising and synthesising literature. The approach for generating the report encompassed three main phases:

- Initial trawl using selection criteria
- Screening and selection
- Analysis and synthesis.

Initial trawl

A systematic search for relevant references from the year 2000 onwards (except for seminal works) in databases using pre-specified search terms. The parameters of the review were agreed with Education Scotland and restricted to the following databases:

- Education Resources Information Centre (ERIC)
- British Education Index (BRI)
- Google Scholar (see note*)
- Scottish Government website (see note*)
- SCOPUS
- The EPPI-Centre Library
- The Australian Education Index (AUEI).

It was also agreed that searches should be restricted to selected databases iteratively. For example, a search using the term 'knowledge mobilisation' was restricted to ERIC in the first instance and expanded to cover other databases, such as BRI, in subsequent searches. A snowballing strategy that involved following up interesting references cited in articles retrieved was also adopted. We were aware that, within the Scottish education context, there are challenges relating to the lack of empirical evidence of knowledge into action. Electronic searches were therefore complemented by email and telephone enquiries with fellow academics, ensuring comprehensive coverage of existing evidence.

Screening and selection

Various search terms were generated and used in locating literature for this report. The search terms were guided by and focused around the main remit of the study to allow for comprehensive coverage. Where the database allowed, phrase searching was employed to ensure identification of appropriate resources. This was done using quotation marks around the key phrases e.g. “knowledge mobilisation”. Without this, every possible source which has the word knowledge or mobilisation would have been identified.

*Regarding Google Scholar and the Scottish Government website, it is not possible to conduct a refined, filtered search and the results of each search produced thousands of possibilities. Within the current project’s resources and timescale, it was not possible to review this number of resources comprehensively. It was decided that the first 50 references would be investigated. We found that, after the first two pages, the relevance of the sources diminished. Any sources located via Google Scholar or the Scottish Government website are accounted for in the figure which outlines numbers of Books / Grey or Online / Policy evidence.

Inclusion and exclusion criteria were specified to determine which materials were more relevant for the final literature review. The criteria were guided by the terms of reference of the project and judgments about the quality/strength of the evidence to support claims made:

- aim and design of the study
- quality of data and analysis
- theoretical and ideological bias
- robust peer-reviewed methodology
- plausibility of claims and causal links based on evidence presented
- relevance within the UK/Scottish context.

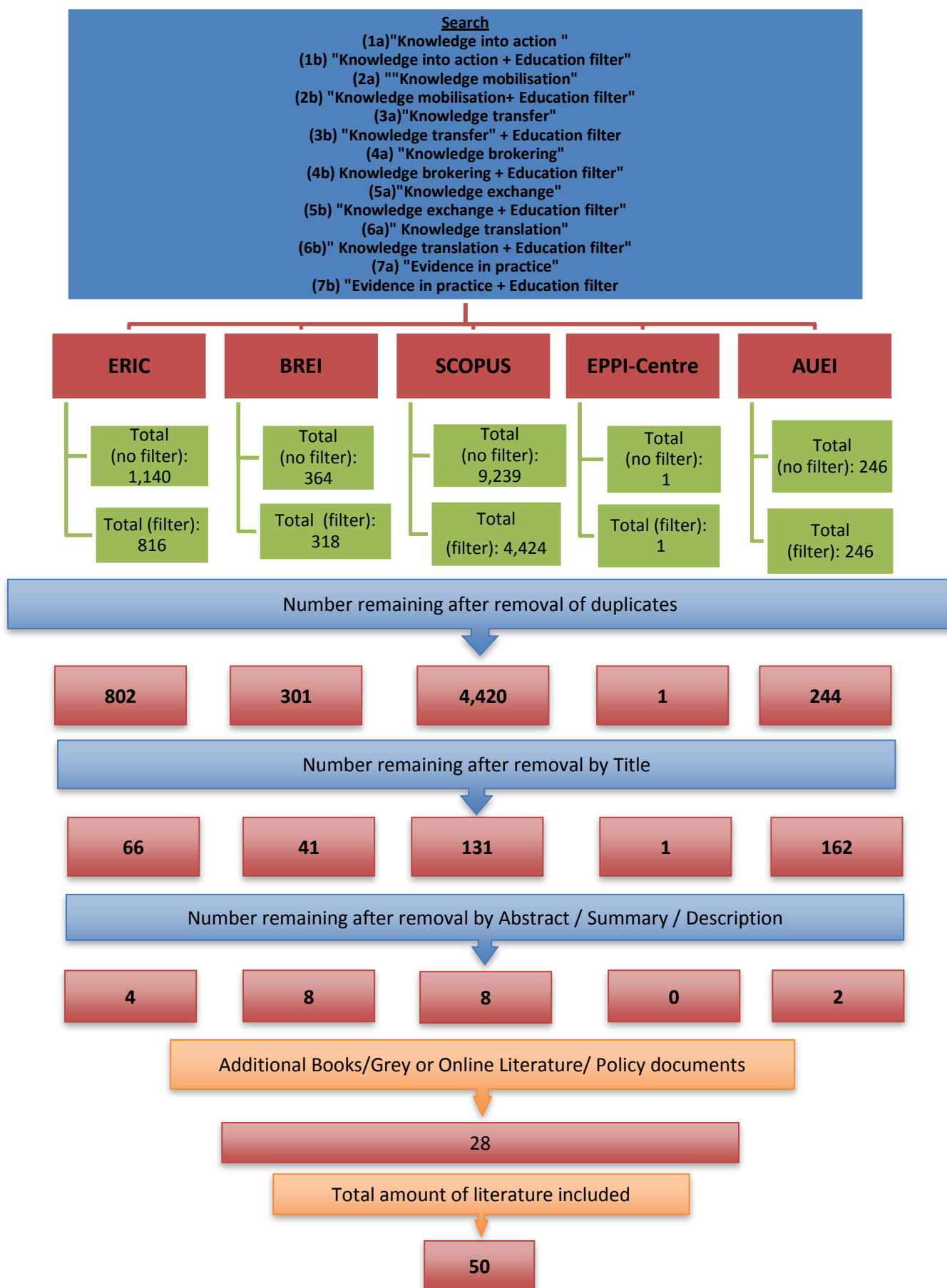
In some databases it was possible to search for peer reviewed and fully accessible literature which added to the robust nature of this literature review. However, in the instances where it was not possible to filter for peer reviewed, fully accessible sources (e.g. Scottish Government, Google Scholar), a pragmatic approach was taken.

Analysis and synthesis

This involved synthesis of findings from the review using a structured protocol. The first stage involved identifying and summarising key elements/findings from each review in order to address the main aim of the research and development project which is *to develop and test evidence-based models that support the effective translation of knowledge into action within Scottish Education*. The literature review also addressed other relevant issues such as the critique of knowledge into action.

Systematic Literature Review Process

Search (1a) "Knowledge into action " (1b) "Knowledge into action + Education filter" (2a) ""Knowledge mobilisation" (2b) "Knowledge mobilisation+ Education filter" (3a) "Knowledge transfer" (3b) "Knowledge transfer" + Education filter (4a) "Knowledge brokering" (4b) Knowledge brokering + Education filter" (5a) "Knowledge exchange" (5b) "Knowledge exchange + Education filter" (6a) " Knowledge translation" (6b)" Knowledge translation + Education filter" (7a) "Evidence in practice" (7b) "Evidence in practice + Education filter"				
ERIC	BREI	SCOPUS	EPPI-Centre	AUEI
(1a) 8	(1a) 1	(1a) 117	(1a) 0	(1a) 3
(1b) 8	(1b) 1	(1b) 57	(1b) 0	(1b) 3
(2a) 22	(2a) 4	(2a) 136	(2a) 0	(2a) 2
(2b) 2	(2b) 4	(2b) 78	(2b) 0	(2b) 2
(3a) 270	(3a) 187	(3a) 7,066	(3a) 1	(3a) 210
(3b) 227	(3b) 155	(3b) 2,461	(3b) 1	(3b) 210
(4a) 4	(4a) 1	(4a) 125	(4a) 0	(4a) 0
(4b) 4	(4b) 1	(4b) 62	(4b) 0	(4b) 0
(5a) 83	(5a) 56	(5a) 1,866	(5a) 0	(5a) 29
(5b) 71	(5b) 48	(5b) 625	(5b) 0	(5b) 29
(6a) 56	(6a) 8	(6a) 1665	(6a) 0	(6a) 1
(6b) 50	(6b) 7	(6b) 1,067	(6b) 0	(6b) 1
(7a) 697	(7a) 107	(7a) 166	(7a) 0	(7a) 1
(7b) 454	(7b) 99	(7b) 85	(7b) 0	(7b) 1



Appendix 2 – What Works Scotland Roundtable

Challenges of knowledge into action -

- Multiple influences on action: policies, budget, performance requirements.
- Who can make decisions?
- Conflicting evidence / insufficient evidence.
- Evidence is weighted towards problem not solution.
- Tension between evidence and innovation.
- Politics of using evidence (tactics).
- Data sharing across organisations.
- Funding weighs towards 'big data'. Showing what doesn't work is difficult. What to disinvest in. Contextual issues are complex, no cut and paste answers. Political climate can change. Relationships between producers, brokers and users are key. Practitioner research helps break down barriers.

Evidence taken from discussion at 'What Works Scotland?' Knowledge into action roundtable event on the 6 October 2014, Edinburgh.

More details available in WWS publication 'Getting evidence into action to improve Scotland's public services' <http://whatworksscotland.ac.uk/wp-content/uploads/2015/02/WWS-MortonWright-Working-paper.pdf>