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Using design to mobilise knowledge from health research into practice

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Abstract

£8 billion per year is spent on health related research and there is a responsibility to demonstrate a return on investment (Walshe & Davies, 2013). Yet currently the translation of health services research knowledge into everyday practice remains a challenge (World Health Organisation, 2006). This challenge is known as the second knowledge translation gap (T2) or 'campus to clinic' gap (Greenhalgh & Wieringa, 2011).

Knowledge is defined by Aristotle in three distinct forms: episteme (facts), techne (skills) and phronesis (practical wisdom). In the context of health services research 'knowledge' is often interchangeable with 'evidence' and is defined as 'research evidence', 'clinical experience', 'patient experience' and 'information about the local context' (Rycroft-Malone et al, 2004). 'Translation' has many broad interpretations, with the process element being described as 'transfer', 'exchange', 'brokering', 'utilisation', 'implementation' and most recently 'mobilisation'.

This gap has given rise to a focused scientific field of study specifically exploring implementation, and resulted in models of factors affecting the implementation of research knowledge into everyday practice.

In this research, the author started from the position that implementation is not a science but a practice; a practice that shares many similar traits with design practice. And therefore design practice can offer suggestions as to how to improve implementation of health research knowledge into practice.

A review of concepts underpinning participatory design and design practice was conducted and compared to the consolidated framework compiled by Damschroder et al (2009). This created two distinct descriptions that were overlaid. This paper presents these and the similarities and differences between the two are discussed to present an argument for the use



of design practice to support the implementation of health services research knowledge into everyday practice.

Keywords: Participatory design practice, Knowledge Mobilisation, Translation, Prototyping

Introduction

£8 billion pounds is spent annually on health related research and the research community has a responsibility to demonstrate a return on investment (Walshe & Davies 2013). Yet currently the translation of this health services research knowledge into everyday practice remains a challenge (The World Health Organization 2005). This translation challenge is known as the second knowledge translation gap (T2) or 'campus to clinic' gap (Greenhalgh & Wieringa 2011).

Knowledge is defined by Aristotle as distinct forms: *episteme* (facts), *techné* (skills) and *phronesis* (practical wisdom). In the context of health services research 'knowledge' is often interchangeable with 'evidence' and is defined in four categories: 'research evidence', 'clinical experience', 'patient experience' and 'information about the local context' (Rycroft-Malone et al. 2004). For many in the health research domain, this is strongly associated with the idea of a hierarchy of evidence where the 'best' evidence is describe as research evidence arising from meta-analysis, systematic reviews and randomized control trials and the 'least reliable' evidence arising from case studies or expert opinion. However, it is also becoming more accepted that in order to create interventions that are accepted, work in the context and are sustainable, that these four different kinds of evidence or knowledge (research, professional experience, patient experience, contextual) have to be combined or synthesized to create such interventions. (Rycroft-Malone et al. 2002)

The area of knowledge translation is relatively new with indexed terms first being found in the early 70's but the 'translation' concept has evolved and broadened through several terms including 'translation', 'transfer', 'exchange', 'brokering', 'utilisation', 'implementation' and most recently 'mobilisation'. For the purposes of this paper we will use the term 'mobilisation' along with the definition provided by the WHO (2006) '*...the synthesis, exchange and application of knowledge by relevant stakeholders to accelerate the benefits of global and local innovation in strengthening health systems and advancing people's health...*'

Science of Practice

Medicine is defined by (Montgomery 2006) as neither a science nor an art, but a practice. Specifically, she says, an uncertain, paradox laden, judgment dependent, science using, technology-supported practice.

George Cox (President of the Institute of Engineering Designers and previous president of the Design Council) described 'Creativity' as the generation of new ideas, 'Innovation' as the successful exploitation of new ideas and 'Design' as what links creativity to innovation – it shapes ideas to become practical and attractive propositions to users and customers. (Cox 2005)

Design could also equally be called a practice; informed by science, utilising creative thinking and approaches, supported by technology and judgement dependent. The author proposes that Implementation could be defined in a similar way; as a practice informed by science and

supported by technology but requiring judgements and adaptation along the way. Could it also benefit from creative thinking and practices?

Method

A literature review was conducted to try to find links between Knowledge Mobilisation (KM) literature and Participatory Design Practice. The review was not intended to be exhaustive but to highlight connections and to act as an initial definition of the landscape that might inform more systematic reviews.

The aims of the review were:

1. To increase the authors personal knowledge and understanding of the field of KM
2. To identify any existing links between KM and Participatory Design Practice
3. To identify key frameworks and models within KM
4. To identify key frameworks and models within participatory design practice

An initial scoping review was conducted exploring terms linking Knowledge Mobilisation (KM) and Participatory Design Practice, using Scopus, Web of Science and Google Scholar to find evidence of outputs linking these two fields. Individual search terms for KM and separately for Participatory Design Practice were also explored in the same databases.

Subsequently, a variation of a 'Snowball' sampling method was used (Booth et al. 2011). Three key papers were identified as origin points for this sampling method:

- a. For KM literature: Damschroder, Laura J., *et al.* "Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science." *Implement Sci* 4.1 (2009): 50.
- b. For what designers do and how they think: Cross, Nigel. *Designerly ways of knowing*. Springer London, 2006. (Cross 2006)
- c. For Participatory Design Practice: Ehn, P., 2008. Participation in design things. *Proceedings of the Tenth Anniversary Conference on Participatory Design 2008*, pp.92–101

The Damschroder paper is highly cited and pulls together 19 different implementation models bringing a critical mass to the underpinning concepts and theories. They claim to have reached a 'saturation' point beyond which additional sources added nothing new.

The Cross paper is also highly cited in Google Scholar. Nigel Cross studied designers and the way they work for many years; across different design disciplines (product, graphic, architecture, automotive etc).

Pelle Ehn is considered to be one of the Godfathers of participatory design or at least a key individual in the formation and on-going development in participatory design. Again, experts in the field of academic design point to Ehn as one a primary source to anyone wanting to know more about participatory design.

These three papers were used as snowball sampling origin points for these three different fields of enquiry and used to initially define a framework (along with the aims outlined above) for defining relevance (and hence inclusion criteria) for and subsequently exploring content of included results. This framework was iteratively evolved as the review process unrolled and was used to refine the included publications initially using a title and abstract review and later using a full paper review.

Results

The initial scoping review demonstrated that there were no direct links between KM literature and Participatory Design Practice. A limited number of results were returned from each database (20-35) but all of these were in the field of Human Computer Interaction (HCI) and none of them were specifically about Knowledge Mobilisation or Translation - they simply had inferred conclusions that participation of relevant stakeholders would improve uptake of the intervention.

The snowball sampling methods returned initial results shown in Table 1.

Table 1: Table of initial snowball sampling results

Origin	References	Citations (as of 26/03/2015)	Total
Damschroder	86	426 (Scopus)	512
Cross	107	1144 (Google Scholar)	1251
Ehn	53	175 (Google Scholar)	228

Subsequent refinement in two stages by title and abstract and secondly by full paper review reduced this to a more manageable level but also included some secondary level forward and backward publications. Some additional grey literature around KM was also added to the included material to enhance the context of this field on advice from KM experts.

Damschroder captures the KM field and consolidates the bulk of the models and frameworks in this field. Rycroft-Malone et al (2004) in their Promoting Action on Research Implementation in Health Services (PARIHS) framework included in the Damschroder consolidated model, summarise the main considerations into three categories of 'Evidence', 'Context' and 'Facilitation'. Damschroder goes into slightly more detail with five categories of 'Intervention', 'Outer Context', 'Inner Context', 'Individuals' and 'Implementation Process'. The first of these categories aligns with

the Rycroft-Malone category of 'Evidence', the second two categories obviously align with Rycroft-Malone's 'Context' category but make the distinction between micro-system and the macro-system (clinical and hospital or hospital and national policy) and has strong links to do with perceived and real loci of control. The fourth category ('Individuals') includes 'facilitator' considerations.

The Cross and related sources highlight the differences in the way that designers think compared to other disciplines. As generalizable summaries Cross defines:

- 'Science' as studying the natural world with methods based on controlled experiments, classification and analysis, valuing objectivity, rationality, neutrality and a concern for the 'truth'
- 'Humanities' as studying the social world with methods based on analogy, metaphor, and evaluation, valuing subjectivity, imagination, commitment and a concern for the 'justice'
- 'Design' as studying the artificial world with methods including modelling, pattern formation, synthesis, valuing practicality, ingenuity, empathy and a concern for appropriateness

Ehn and related sources describe Participatory Design Practice as the engagement of relevant stakeholders in a design process such that the stakeholders can influence the process and the outcome. In the context of healthcare innovation this would include health services researchers, patients, health professionals, service managers and designers. It is based on both pragmatic and democratic values; pragmatic in that, engaging those who will use the product or service ensures that what is developed is something they will use and democratic in that those end users have a fundamental right to influence something that will affect their lives. The collective, practical and iterative prototyping and 'making' process accesses their explicit knowledge and through the practical activity, also accesses embodied tacit knowledge. The iterative making process is really an exploration of how these different forms of knowledge will best fit together. Terms such as 'facilitator' and 'facilitation' are applied to the designers and their role whilst terms such as 'engaging', 'empowering' are applied to the participatory experience of the non-designer participants. There are references to the power of graphical and physical language to cut across boundaries and make communication easier. Ownership is an important and underpinning value. There are references to the greater ability to reframe problems from multiple perspectives and the greater potential for ideas when participation is opened up and diverse stakeholders included. As George Bernard Shaw said:

"If you have an apple and I have an apple and we exchange apples then you and I still have one apple. But if you have an idea and I have an idea and we exchange ideas, then each of us will have two ideas."

Discussion

Overview

A literature review in the space of 'Knowledge Mobilisation' and 'Participatory Design' is problematic. The terminology on both sides of this fence is generic, even ubiquitous and does not lend itself to literature searching. There is wide spread interpretation, use, misuse and abuse of the words 'design' and 'participation'. Likewise with both 'knowledge' and 'mobilisation' where 'knowledge' is interchangeable with 'research' and 'evidence' (all three very generic words) and 'mobilisation' is interchangeable with 'exchange', 'transfer', 'translation', 'utilisation', 'implementation' or 'brokerage'.

This is compounded further by the tendency of the two domains to disseminate their work in different ways that aren't typically referenced by the same databases or even published in the same formats. A recently completed Arts and Humanities Research Council (AHRC) network project exploring the Extent of the Art of Design in Health included a literature review of publications reporting design related activity in a healthcare context. Hence the reason that the Cross and Ehn papers focused on sources from Google Scholar whilst Damschroder focused on sources from Scopus.

Knowledge Translation/Mobilisation

A systematic review (Damschroder et al. 2009) pulled together a number of different models and frameworks of KM and explored the different concepts and constructs within each model, accounting for label variation with overlapping definitions. This was continued until there were no new concepts arising from the addition of further models and frameworks. This was pulled together into a consolidated framework covering 19 different models based loosely on the 'diffusion of innovation'. Knowledge Translation or Mobilisation strategies roughly fall into two categories; Integrated Knowledge Translation (iKT) and End-of-grant Knowledge Translation (KT) (Graham 2012). Generally, public health initiatives tend to use iKT (Powell et al. 2013) more than acute health care services that tend to favour KT models more. Initial and superficial inspection would suggest that participatory design would sit within iKT but as discussed later, it may have something to offer to more general KT models also.

There are several references in KM literature to the potential for co-creation or co-production methods to benefit sustainability and spread of evidence (Wilkinson et al. 2012). There is also a strand of KM literature that explores the use of creative practices to elicit different forms of knowledge (Simons & McCormack 2007). This endorses many aspects of what this author would claim that Design can bring to the field of KM. There is a distinct difference with participatory design in that the creative practices are engaged as a way of knowing, and understanding experiences whereas the author here would claim that collective making or prototyping does this

but in addition it is purposefully seeking to make something else, something new and better (Bevan et al. 2007).

Designers and Participatory Design Practice

In the context of this paper, designers and design practice would appear to offer some inherent attributes that are valuable to KM. However, there are specific aspects of designers and participatory design practice, that are worth expanding on in more detail.:

1. Designers enable greater potential for generation of new ideas
2. Collective making can access tacit knowledge and enable real-time knowledge synthesis.

Conceptualising things (products, services) that don't already exist is difficult. Enabling others to come up with new ideas is even harder. If one only ever frames what is possible based on what one has previously experienced, then creativity would be 'stuck' within the circle of our current knowledge and radical leaps would be much fewer. Participatory design practice enables people to imagine alternative future possibilities and scenarios, to hold up vision of an alternative future.

The collective and iterative making process makes concepts tangible, sharing them and letting them evolve. The physical activity of making can be used to elicit subconscious or tacit knowledge. The collective making process enables participants to contribute their explicit and tacit knowledge. The iterative prototyping can be utilized via 'sacrificial' prototypes (2D, 3D or digital) to test priorities and assumptions of different stakeholders using an abductive approach, offering up a range of appropriate solutions rather than trying to find the 'right' one. The real time nature of the collective making enables the synthesis of knowledge from different stakeholders and learning about the problem-solution, with relevant context specific knowledge, experiential knowledge and in-practice knowledge.

Conclusions

With reference back to the original aims of the review,

1. There are a number of key KM frameworks that enable readers to gain an oversight of general strategies to KM but these tend not to offer specific practical guidance on how to mobilise knowledge, just what to consider in implementation.
2. There are references in KM literature to the potential for co-production to be a valuable approach to sustainability and spread.
3. There are references to creative practice in KM literature as a strategy for inclusive dialogue aimed at created shared understanding.

4. Participatory design practice embodies many attributes that are beneficial to KM strategies; not unique to design but conveniently packaged:

It is engaging, empowering, 'bottom-up' approaches, levelled hierarchies, reduced power structures, common language, cultural relevance and external facilitation. Multiple perspective enable problem reframing.

5. Participatory design practice also includes attributes that are significant strengths or even unique attributes other approaches do not include.
 - a. Generation of new ideas.
 - b. Real time knowledge synthesis
 - c. Eliciting and embodying tacit, experiential knowledge

Participatory design practice has great potential to provide practical KM strategies but this would benefit from more case study evidence.

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