Building the Concept of Research Impact Literacy

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Abstract

Impact is an increasingly significant part of academia internationally both in centralised assessment processes (eg. UK) and funder drives towards knowledge mobilisation (eg. Canada) Narrowly focused assessment or institutional ranking approaches can obscure the benefits of brokering research into practice. It is vital that academics, non-academic stakeholders and research managers alike fully comprehend how to generate and demonstrate impact. Derived directly from UK and Canadian experiences of supporting impact and knowledge mobilisation, this paper introduces the original concept of impact literacy. Implications of poor impact literacy for the successful mobilisation of research are discussed alongside requirements for associated skill development.

Background and previous work

Research impact is defined by the Higher Education Funding Council of England (HEFCE) as "*an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia"* (HEFCE, 2012 pg 26). Fundamentally impact is the (provable) real world benefits derived from academic research and research expertise more generally. Creating and reporting on the impacts of research beyond the academy is now a regular feature of academic research. However, the underlying knowledge and skills to achieve impact are arguably underexplored. More specifically as yet there is no conceptual framework for the nature of the comprehension necessary to underpin impact practice.

Impact is a function of academic knowledge creation, its dissemination to and uptake by non-academic partners who then use the research evidence to inform implementation of new products (by industry), policies (by government), services (by community agencies) and creative works (by arts based organizations) to improve the lives of end beneficiaries (Phipps, Cummings, Pepler, Craig and Cardinal, 2016; Morton, 2015). Knowledge brokering, the active facilitation of the engagement of research and researchers with end users and non-academic research partners, can support these pathways to impact (Ward, House, Hamer, 2009; Dagenais, Laurendeau and Briand-Lamarche, 2015) although the effectiveness of knowledge brokering has yet to be established through rigorous evaluation (Bornbaum, Kornas, Peirson and Rosella, 2015; Dobbins et al 2013).

International impact differences: reflections from UK and Canada

Impact – and the associated pursuit of pathways to impact – is becoming progressively weaved into the landscape of academic research internationally. In recent years, research impact in the UK has been most substantially driven by the centralized Research Excellence Framework (REF, see www.ref.ac.uk for details and results). Newly introduced to the 2014 assessment process, case studies outlining the demonstrable changes beyond the academy ensuing from academic research were worth 20% of the overall mark (See HEFCE, 2011 for determination of weighting) and thus contributed significantly to the

funding universities subsequently received from the government Definitions of impact for REF are narrow, discounting benefits to the academy and those not arising directly from demonstrably 'excellent' research or from the activities of researchers and graduate students beyond their established bodies of evidence. Impact is also a vital part of the competitive funding stream of the UK's dual funding research system, with Research Council UK (RCUK) grants requiring strong 'Pathways to impact' statements on the generation of benefits from discrete research studies. RCUK definitions of impact mirror - but are slightly broader than - those for REF, and include benefits within the scientific community, As RCUK specify:

> *A clearly thought through and acceptable Pathways to Impact statement is an essential component of research proposals and a condition of funding. Grants will not be allowed to start until a clearly thought through and acceptable Pathways to Impact statement is received. Research Councils have agreed that if an application is considered excellent for research in terms of the proposed research but has a poor Pathways to Impact statement, funding will be withheld until a clearly thought through and acceptable Pathways to Impact statement has been received (http://www.rcuk.ac.uk/innovation/impact/).*

In contrast, Canada does not have a centralized system of research impact assessment. It is instead driven primarily by funders' requirements to plan for and report on the impacts of research. Most Canadian academic research funding agencies require a strategy for knowledge mobilisation (in the social sciences and humanities; http://www.sshrc-crsh.gc.ca), knowledge translation (in health; http://www.nserc-crsng.gc.ca/) and commercialization (in natural sciences and engineering; http://www.nserc-crsng.gc.ca/). Researchers are required to report on impacts of research in end of grant reporting to funding agencies (a process similar to RCUK's 'Pathways to Impact' and reporting to the repository Researchfish), but this is subject only to a staff review of the end of grant report. This is not subject to a national peer reviewed

assessment process. Thus whilst Canada and the UK align on strategizing impact from the funding stage, the prominence vs. lack of centralised impact reporting in the UK and Canada respectively drive differing paradigms across academia. For Canada, support for the process of transferring, exchanging and mobilising knowledge is key; for the UK, any such processes, whether supported or not, must result in demonstrable benefits if they are to be valued. The (dis)proportionate focus on 'what' (UK) versus 'how' (Canada) unintentionally masks the vital link between the two.

The emerging focus on impact has created an agenda with operational implications for researchers, institutions, funders and governments. Impacts do not (usually) occur serendipitously. Since the passage of the US Bayh Dole Act in 1981 commercialization and technology transfer have become well established practices globally. Focused on patenting, licensing and entrepreneurship these ubiquitous practices support the impacts of research mediated through commercial transactions. More recently a focus on the non-commercial impacts of research on public policy, professional practice and social services has been receiving increasing attention both as a scholarly discipline and as an increasingly professionalized practice (see Nutley, 2007). Across the sector there has been a shift from technology transfer as a primary route, to technology transfer as a component of more comprehensive and less unidirectional means of achieving impacts. With the arrival of the formal impact agenda, non commercially-focused researchers faced the challenge not only of generating and articulating benefits from their research, but also doing so by drawing on models previously largely applied to profit-based effects.

Effectively creating and articulating research impacts requires researchers to develop bespoke pathways grounded in the nature of the academic work itself as well as the corresponding impact targets and the non-academic organisations that are critically important in facilitating impact (Morton, 2015). Again RCUK guidance emphasises this need for tailored strategies over generic pathways (http://www.rcuk.ac.uk/innovation/impacts/):

"A clearly thought through and acceptable Pathways to Impact statement should:

- be project-specific and not generalised;
- be flexible and focus on potential outcomes;"

Further evidence is provided by analysis of the 2014 REF results (King's College London and Digital Science, 2015) which confirms there is no singular pathway to impact. Of the 6,647 submitted impact cases, 3,709 unique impact pathways were identified from all academic disciplines working with non-academic partners across the public, private and non-profit sectors. Such path diversity both precludes prescriptive approaches to impact and underscores the need for tailored approaches.

Research Impact Practitioner roles

The need to comprehend diverse aspects of research impact is not limited to those working in formal impact roles. Unless an academic also holds a practitioner role through which research can be directly implemented (e.g. a clinician-scientist, a school teacher undertaking a PhD in education or a social work faculty member who maintains a practice), s/he cannot create impact independently. Multiple agents, especially implementation partners, are needed to successfully negotiate the translation of research into benefits (Morton, 2015). For the purposes of this paper we will therefore use the umbrella term '*research impact practitioners'* to reflect all those who undertake work individually or in teams helping to support the translation of research to impacts. This includes but is not restricted to academic researchers, impact officers, knowledge brokers, public engagement professionals, research support staff and all those whose work aligns to realising non-academic benefits of research.

Impact Literacy

With this need for comprehension, we here present the new concept of *impact literacy.* This is derived from both authors' extensive experience of supporting impact/knowledge mobilisation and draws from

broader literature on health literacy (the ability to comprehend information to engage in empowered decision making about one's health). Reflecting the UK and Canadian experiences, along with the implications for research impact practitioners, impact literacy is conceptualised as the intersection of three elements of research impact:

1. The identification, assessment, evidencing and articulation of impact endpoints ("what")
2. The practices that create impact ("how")
3. The successful integration of these by research impact practitioners ("who")

1. "What"

Much of the practice of research impact assessment ("what") can trace its roots to the Payback Model (Buxton and Hanney, 1996) which articulated five impacts arising from health research: knowledge; research benefits; political and administrative benefits; health sector benefits; and broader economic benefits with the latter three representing impacts beyond the academy. The Payback model has been used for example by RAND to assess the impacts of the research funded by the Arthritis Research Campaign (UK). This required developing and populating a logic model and then constructing narratives to articulate the impacts of arthritis research (Hanney, Grant, Wooding, and Buxton, 2004). Impact models such as Payback are underpinned by a linear (albeit iterative) logic which leads sequentially from research to ultimate impact. There is thus an underlying assumption that impact can be identified, measured and reported; this practice is the antecedent of the REF process in the UK

2. "How"

The practice of research impact assessment (the "what") is inextricably linked to the methods and means of creating research impact (the "how"). A review of systematic reviews of the literature on methods for creating impacts of research showed that multifaceted methods are more effective than individual interventions (Boaz, Baeza and Fraser, 2011). These methods for creating impacts of research fall into

two broad categories: 1) dissemination or transfer methods; and, 2) co-production or engaged methods. The Canadian Institutes of Health Research describes these as "end of grant" and "integrated" respectively (CIHR, 2012) indicating that practices can occur after the research has concluded or throughout the research process including upstream to inform the research agenda using stakeholder engagement as has been described in disability research (Camden et al, 2014). There is general agreement that integrated methods are more effective than end of grant methods (Gagnon, 2011; Ross, Lavis, Rodriguez, Woodside and Denis, 2003). Indeed, Van de Ven and Johnson (2006) and more recently Bowen and Graham (2013) have framed the knowledge to action gap as a problem not of knowledge transfer (i.e. end of grant dissemination) but of knowledge production (i.e. integrated or engaged scholarship). Drawing on evaluation science if impact is what one is seeking to achieve (the dependent variable) then knowledge mobilisation/exchange/translation is what one changes to influence impact (the independent variable). Measuring research impact is arguably measuring the effectiveness of knowledge mobilisation plans and subsequent activities that connect the production of research outputs to their impacts beyond the academy.

Canadian organizations have also developed impact planning (and hence impact assessment) frameworks. The Canadian Academy of Health Sciences (CAHS, 2009) framework traces the progress from research outputs to improved health and wellbeing and economic and social prosperity in a five stage logic model. The CAHS framework is being operationalized as the research impact planning and assessment framework for Canadian provincial health research funding organizations as exemplified by the Alberta Innovates Health Solutions (Graham, Chorzempa, Valentine and Magnan, 2012). Extending the CAHS framework by including a co-produced element throughout the logic model informed the *co-produced pathway to impact* that has been adopted as the research planning framework by large, multi-million dollar Networks of Centres of Excellence (Phipps et al, 2016).

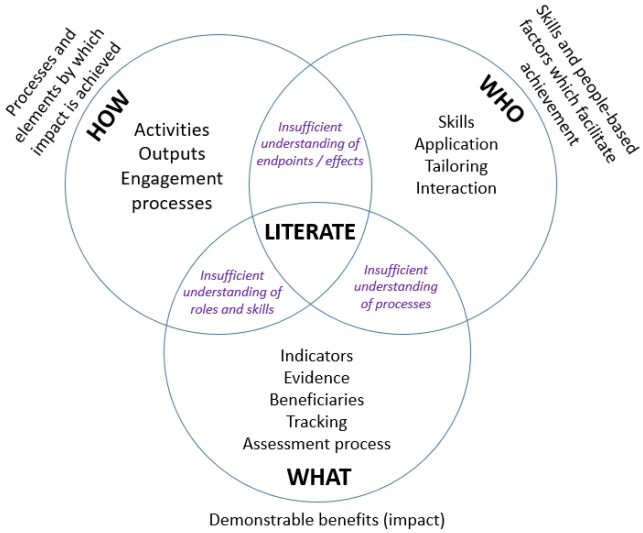
3. "Who"

A common feature of research impact practitioner roles ("who") is their support of activities that create and/or assess and articulate impacts of research beyond the academy. Whilst communication skills are likely integral to many of these positions, these roles are distinct from communication professionals (Barwick, Phipps, Myers, Johnny and Coriandoli, 2014). A systematic review of knowledge brokers identified 10 distinct tasks and 39 associated activities of knowledge broker practice (Bornbaum, Kornas, Peirson and Rosella, 2015); however, this diversity of skills and foci has been cited as a challenge for the planning, training and sustainability of these roles (Lightowler and Knight, 2013; Chew, Armstrong and Martin, 2013). In addition to these tasks and activities, the qualities (Phipps & Morton, 2013) of knowledge brokers and their organisational context have received attention as described by Browen and Graham, 2015. "*Recognition of the importance of organizational context has resulted in a shift from focusing on individuals who broker knowledge between specific individuals to the concept of knowledge brokering as an organizational process*." (page S5). It is the effectiveness of these individuals (within their organizational context) in facilitating "what" and "how" collectively that leads to impact.

Conceptualising Research Impact Literacy

Drawing together the literature on understanding "how" to create research impact, "what" to measure and "who" supports these activities can be graphically represented (see figure 1). Comprehending the intersection of how, who and what creates impact literacy.

Figure 1: The intersect of What, Who and How to create Impact Literacy



Impact can be pursued without being literate, but this is likely to lead to poor execution, missed opportunities, poor resource use and misaligned or underachieved targets. Only by comprehending all three elements can impact be pursued effectively, with clear implications for poor literacy where only two elements intersect:

A. HOW and WHO in the absence of WHAT leads to insufficient understanding of the ultimate impacts, indicators, evidence and assessment thereof.
B. WHO and WHAT in the absence of HOW leads to insufficient understanding of the bespoke and nuanced processes by which impact is achieved
C. HOW and WHAT in the absence of WHO leads to insufficient understanding of the roles and skills required to plan, generate, execute and assess impact and results in poorly informed and unsupported impact strategies.

Drawing on earlier UK-Canada comparisons, arguably Canada's focus on supporting impacts through knowledge mobilisation/translation ("how") with less focus on the evidence of impact places them at risk of (A). In contrast the UK's focus on planning pathways and reporting demonstrable effects ("what")

makes (B) the more likely limitation. In countries where the impact agenda is beginning to emerge, the concept of impact literacy offers a means to consider the most effective ways to build and configure national, local and institutional approaches.

Recognising impact literacy

If impact literacy is the state of understanding *who* undertakes the *how* to create *what* impacts across the spectrum of research-to-impact activities, then an individual can be deemed impact literate if s/he:

1. Knows *how* to create impact; and
2. Knows *what* impact can be achieved, articulated and evidenced appropriately and
3. Understands the skills needed by research impact practitioners to effectively navigate both #1 and #2.

Extending this concept further, we can shift from a binary sense of impact literate vs. illiterate. Whereas illiteracy is the absence of at least one of the three elements, literacy itself – the intersection of all three impact elements - can range from a basic awareness through to a higher level comprehension. This proposition is reinforced by drawing on the parallels with health literacy. Guzys, Kenny, Dickson-Swift and Threlkeld (2015) identified a number of characteristics of health literacy which align with characteristics of integrated methods of creating research impact. These include the recognition that (health) literacy is complex, multifactorial and context dependent. Achieving (health) literacy requires involving end users in developing (health) literacy frameworks to distribute power between (health) providers and (health) consumers. Extending this parallel further, Chinn (2011) describes three progressive levels of health literacy:

> **Basic/Functional literacy**: basic reading, writing and literacy skills, as well as the knowledge of health conditions and health systems which are the desired outcomes of traditional health education initiatives;

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246 **Communicative/interactive literacy**: communicative and social skills that can be used to derive
247 meaning from different forms of communication, and to apply new information to changing
248 circumstances;

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250 **Critical literacy:** higher level cognitive skills and social skills required to critically analyse
251 information, and to use this information to exert greater control over life events and situations
252 through individual and collective action to address the social, economic and environmental
253 determinants of health." (page 61).

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255 Research impact practitioners may build their level of literacy through the study of evidence derived from
256 peer review literature, practice based guidelines, grey literature and tacit knowledge of practitioners. This
257 evidence base reflects a continuum of knowledge from anecdotal to rigorously proven. As such,
258 practitioners must develop the skills needed to discern the strongest and most appropriate methods. We
259 further therefore propose a similarly tiered approach to impact literacy, wherein basic, intermediate and
260 advanced literacy levels underpin progressive levels of integration and critique of available evidence (see
261 table 1)

262 **Table 1: Three levels of impact literacy**
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Literacy level	Integration and critique of evidence	Description of level
Basic	Aware	Aware of the evidence, understands there is a body of expertise, knowledge and tools which can underpin practice but demonstrates insufficient understanding on how to draw on these in practice. Likely to be able to comprehend at a project (small scale) level
Intermediate	Engaged	Informed by and engaged with the evidence, understands there is a body of expertise, knowledge and tools which can underpin practice and can draw on these prescriptively in practice. Likely to be able to comprehend at a programme (higher order) level
Advanced	Critical	Critical of the evidence, understands there is a body of expertise, knowledge and tools which can underpin practice and is able to (i) synthesize, (ii) critique and (iii) add /extend the evidence base– Likely to be able to comprehend at a strategic and/or systems level

It is important to note that neither literacy nor critical assessment skills unequivocally match job roles or seniority. Whilst there is a plausible expectation that literacy is higher in those holding more strategic roles, the complexity of impact and detail-orientation in operational roles may provide differential profiles within institutional hierarchies.

Discussion

This paper presents the concept of impact literacy as a schema which aids the understanding of impact and associated processes. The intersection of "what", "who" and "how" offers a simple description of the elements needed for research impact, and this schema may help inform training and development approaches for research impact practitioners.

A model is a necessarily simplified description of complex processes such as those in implementation science where research is informing practice or policy (Nilsen, 2015). We recognise that the simplicity of the presented model risks masking the breadth of research impact and knowledge mobilisation processes required for effective research impact. Undoubtedly attempting to singularly configure 'literacy' is open to criticism, particularly from those whose work does not align with all three elements or for those research impact practitioners for whom increasing comprehension is challenged by lack of training and mentorship. Impact can take many years to achieve (Hughes and Martin, 2012) and with extensive focus on assessment there can be perverse incentives to pursue short term measurable goals ahead of pursuing meaningfully appropriate paths. Alongside ongoing debates on metrics (Wilsdon et al, 2015), there is continued need for discussions on shifting rhetoric away from linear 'input-output' models towards an understanding of the more iterative and engaged process of impact creation as may be derived using evidence informed tools such as Melanie Barwick's Knowledge Translation Plan template (http://melaniebarwick.com/training.php) to inform the development of both co-produced research and co-produced impact. Notwithstanding criticisms and ongoing debates on impact itself, the principle of an

underlying literacy underscores any such discussions about the most meaningful and appropriate ways to create and assess benefits of research.

Conclusions and implications

Knowing how impact 'works' is central for guiding research impact practices and the people who support them. The literacy of research impact (i.e. knowing) is distinct from the skills and competencies (i.e. doing) of research impact practitioners. Literacy automatically extends to competence especially in the practice of research impact, but arguably any research impact practitioner should use knowledge to inform practice and practice to inform knowledge. Decoupling literacy from competence in this paper is a purposeful attempt to separately examine 'knowing' and 'doing' ahead of a necessary connection to enable impact to be achieved. Moving beyond knowing about impact (research impact literacy) to executing the practice of research impact requires an additional focus on the skills and qualities of research impact practitioners. At present therefore there is arguably a 'know-do' gap: literacies cannot be put into practice without developing the relative competencies, and knowing and doing are mutually reinforcing factors. This "know-do" gap is well known in impact literature (Booth, 2011), and is neatly encapsulated in Goethe's assertion that "*knowing is not enough; we must apply. Willing is not enough; we must do.*" (cited in World Health Organization, 2004, page 3). Future practitioner-focused research must focus on the development of the competencies needed to maximise the translation of research into real world benefits, connected to and underscored by a critical level of impact literacy.

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