"Putting in more than you take out" Towards evaluating research based on its public (not private) contributions[1]

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Abstract

There has been an increasing interest within research policy to measure the impact that research had in society, but also among academics to understand how research creates impacts beyond the traditional measures of patent licenses and spin-off creation. In these debates, there is often an emergent gap between research impact conceptualisations of ideas creating capacity and change in society, and the reality that it is very hard to measure the flow of ideas, but rather easy to measure transactions linked with those flows. In this paper we are concerned with the indicator periphery that emerges as a consequence of the impacts of some kinds of research better fitting to these underlying transactions than others. A range of lacunae emerge in indicators where the impacts of particular fields are badly captured by transactional measures – e.g. in social science and humanities (SSH) disciplines. This study addresses "how can we typologise the non-transactional ways in which publically funded research creates public benefits?" We start from a sociological approach to consider academic contribution to societal changes as the rate of inflow of usable knowledge into a reservoir (i.e. latent potential knowledge accumulated to later be exploited) dependent on the extent to which academic knowledge is cognate with potential social users. We draw on the openness framework to consider the five micro-practices by which scientists make research cognate with potential users, and we seek to categorise these micro-practices according to the different kinds of situated social learning practices they embody to create specific knowledge. To do so, we draw on twelve cases of study of Spanish SSH research groups (within the Siampi project) to develop a detailed typology of the kinds of micro-practices associated with openness as the basis for a new perspective for indicators of research impact that goes beyond the traditional transactional ones.

[1] This work was supported by the European Commission 7th Framework Programme (Social Impact Assessment Methods for research and funding instruments through the study of Productive Interactions between science and society - SIAMPI).

Introduction

There has in the last decade or so been an increasing driven within research policy to measure the impact that research had in society (Derrick & Samuel, 2016). We see this in a range of European countries, where research evaluation systems either account for societal impact in various different ways (UK, Netherlands), measure research impact through standing surveys (Spain, the UK) or have attempted to develop robust measures of research impact (Netherlands, Sweden). Although early attempts to measure research impact often followed direct impacts through translating transactions to national levels through equilibrium models, dissatisfaction with these more quantitative approaches has seen the rise of more qualitative approaches, typified by the UK's Research Excellence Framework, in which expert peer panels make qualitative judgements regarding the scope, depths and excellence of research impacts.

There is also increasing academic interest in understanding how research creates impacts beyond licensing deals, spin-off companies and patents, often with reference to these policy interventions. In these debates, there is often an emergent gap between research impact conceptualisations of ideas creating capacity and change in society, and the reality that it is very hard to measure the flow of ideas, but rather easy to measure transactions which may associate with those flows (Benneworth, Hazelkorn, & Gulbrandsen, 2016). In this paper, we are concerned with one aspect of this, the indicator periphery that emerges as a consequence of the impacts of some kinds of research better fitting to these underlying transactions than others. A range of lacunae emerge in indicators where the impacts of particular disciplines and fields are badly captured by transactional measures. Olmos-Peñuela, Benneworth, & Castro-Martínez (2014) for example demonstrate that in particular in the humanities and social sciences, there is a much greater propensity towards informal knowledge interactions than in many of the hard sciences. Our overarching research question in this research in progress is "how can we typologise the non-transactional ways in which publically funded research creates public benefits?"

Our diagnosis here is that this issue arises because of the implicit adoption of the transaction-equilibrium effect heuristic for research achieving impact. To provide an alternative perspective, we turn to sociological rather than economic perspective of science studies. We observe that in this tradition, useful knowledge represents a kind of reservoir of latent potential to later be exploited (in the tradition of the 1970 TRACES study). We therefore propose to consider academic contribution to societal capacity as the rate of inflow of usable knowledge into this reservoir (Hanney, Gonzalez-Block, Buxton, & Kogan, 2003), an additive knowledge production (Becher & Trowler, 2001; Latour & Woolgar, 1979) in turn dependent on the extent to which academic knowledge is cognate with potential social users. We in turn consider the micro-practices by which academics make their research cognate with potential users, drawing on the Openness Framework we have developed elsewhere (Olmos-Peñuela, Benneworth, & Castro-Martínez, 2015, 2016). Drawing on a detailed study of Spanish research groups in the social sciences and humanities within the Siampi project, we develop a detailed typology of the kinds of micro-practices associated with openness as the basis for a new perspective for indicators of research impact.

From an individual to collective perspective on research impact

Current research impact approaches demonstrate a mismatch – on the one hand there is a widespread appreciation of the different kinds of ways in which research creates value in society, but tempered on the other by a tendency in various ways to reduce this to things that

we all know are poor proxies for that impact. That is a severe public policy problem, because if we measure and stimulate the wrong things, we are steering the system towards working to produce the wrong outputs and ultimately creating the opportunities for public value failures. The great power of the economic model is that it is scalable – it takes a micro-level phenomenon and converts it into an aggregate effect that can be compared with other very dissimilar things (Benneworth, 2015; Benneworth, Hazelkorn, & Gulbrandsen, 2016), something which policy-makers find very useful (Molas-Gallart, 2015).

We take a slightly different perspective here, in that we note that in the science studies literature there is a much less instrumentalist stream that questions the extent to which that knowledge exchange comes through immediate researcher-user interactions (Sarewitz & Pielke Jr., 2007). Perhaps fitting with Louis Pasteur's idea of the 'prepared mind' (Garud, Kumaraswamy, & Karnøe, 2010), useable knowledge can be considered as constituting a reservoir which can then later be exploited (Sarewitz & Pielke Jr., 2007). Those interested in *innovation* policy should seek to maximise the outflow of the knowledge from that pool, at which point it becomes transformed and embedded in particular artefacts to which property rights apply. But if you are interested in *science* policy, and in particular publicly funded science, then what is critical here is the rate of **inflow** of knowledge into the pool, from the base of publicly funded science.

Our contribution to this debate about usefulness in science policy is our relation of the rate of inflow to the idea of **user cognateness**; the reservoir metaphor captures all knowledge that might later be taken up by a user. We therefore argue that a characteristic of such knowledge that may later flow out of the 'reservoir' is that it has a cognateness with users, because that cognateness is the basis for any kind of knowledge exchange (Boschma, 2005; Fromhold-Eisebith, Werker, & Vojnic, 2014). We further argue that newly created knowledge is cognate with the knowledge upon which it is build. From this, we deduce that knowledge that is created using 'user knowledge' in some way will have a cognateness later allowing users to exploit it. We therefore argue that (in the frame of our metaphor) the rate of flow into the knowledge reservoir is associated with the extent to which those creating that knowledge incorporate user knowledge into their research micro-practice (our 'openness' variable).

To date we have argued that there are five overarching kinds of research micro-practice where knowledge is materially combined to create new knowledge, and thus where user knowledge may be involved (Olmos-Peñuela et al., 2015). But this approach remains very broad in its perspective, grouping activities that whilst conceptually very similar (research question design, for example), do vary considerably in practices between different fields of study. We are concerned that behind these micro-practices are social learning behaviours in which researchers co-create knowledge in various ways involving users and therefore making it cognate with a wider set of users. Therefore, in this paper we focus on the detail of individual social learning behaviours by which researchers incorporate user knowledge.

For our conceptual model of social learning behaviours, we here use the Amin & Roberts (2008) & Roberts (2014) typologies of different kinds of situated learning practices. Scientific knowledge may be unsituated and generic/ universal, but if there are situated learning processes, then it is the kind of research that can later be fixed and transformed into useful knowledge (Vohora, Wright, & Lockett, 2004). So in this paper we categorise the different research micro-practices according to the different kinds of situated social learning practices they embody to create specific knowledge.

Research progress to date

To address this we will draw on a set of interviews undertaken within the Siampi project (addressing the Social Impact Assessment Methods for research and funding instruments through the study of Productive Interactions)[2] to explore the social learning behaviours associated with the different research micro-practices, to develop a more thorough understanding of how researcher groups build up the cognateness and thus usability of their research. The Siampi dataset was generated under the auspices of a larger European research project involving case studies from four countries in the period 2009-2011, seeking to provide a deeper qualitative understanding of scientific and societal interactions within science. Although we are repurposing the Siampi data for our own needs, the focus of the interviews, there is sufficient correspondence between the questionnaire structure and the openness model to make the dataset fit for purpose, and as an exploratory piece of work we further argue it saves the need for specific activity.

In the Spanish dataset, there are twelve interviews with Social Sciences and Humanities (SSH) research groups where interviews were undertaken with these research groups, as well as with users of the knowledge created by that group. We will seek firstly to identify whether there was evidence in each of the research micro-practices of shared social learning with those partners, and in the case that there was, to classify it according to the Roberts' framework. On that basis we will be able to identify the relative diversity of social learning practices within those research micro-practices by which openness is created as the basis for identifying alternative impact indicators.

The expected output of this research will be materialised in a typology of the kinds of micro-practices associated with openness that may set the basis for a new approach for research impact indicators that goes beyond the traditional transactional ones.

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[2] http://www.siampi.eu/

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