Research impact as a process

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Starting point

- Research impact has traditionally been measured as a relationship between various inputs and outputs

- Simple indicators and input-output relationships have increasingly been criticised
  - The process by which inputs become outputs is blackboxed or overly simplified
  - Problematic proxies for outputs (like patents, publications)
  - Often tied to (abandoned?) linear understandings of innovation
  - Dominate policy debates but often without clear policy recommendations other than changes in inputs

- A process perspective on impact is an alternative (or complement): but what does a process perspective imply, and what can science policy studies learn from other areas that use process methodologies?

Impact as a process

- We know research makes an impact in a process that is non-linear, unpredictable, complex, systemic and unfolds over a long period of time
- This is reflected in contemporary research evaluation approaches:
  - The payback framework (Donovan & Hanney 2011; Hanney et al. 2007)
  - Impact pathways (Douthwaite et al. 2003)
  - SIAMPI (Molas-Gallart & Tang 2011; Spaapen & van Drooge 2011)
  - ASIRPA (Joly et al. 2015)
  - Public value mapping (Bozeman & Sarewitz 2011)
  - Interventionist approaches such as RRI and transformative innovation policy
- These are based on science studies perspectives and (mostly) imply ex post assessments of how research units, projects etc. have had different types of effects for different kinds of stakeholders at different stages of a process

Other process perspectives

- Innovation (van de Ven et al. 2000; Poole et al. 2000; Garud et al. 2013)
- Organisations, organisational change (Pettigrew 1990; Burgelman 1994, 2011; Hernes 2008)
- Sociology of professions (Abbott 2001 and earlier)
- Industrial ecology/symbiosis (Boons et al. 2014)
- Work climate (Amabile & Kramer 2013)

- Influential writings here on methodological aspects – intimately tied to **longitudinal case methods**

Assumptions/ontology

- Standard definition: A process is a series of actions or steps taken in order to reach a goal

- Theoretically process perspectives imply seeing phenomena as not stable but rather "in flux" or as a stream of events

- Most often tied to frameworks using terms like "complexity", "evolutionary", "non-linear" and similar

- The process perspective highlights aspects of phenomena that one would not be clearly visible using another perspective

Advantages of a process perspective

- Opens the "black box" to help understand how inputs are related to outputs and can perhaps be particularly valuable to understand the complex reasons behind "success" and "failure"

- Allows entities to transform, move or even disappear without leading to missing data

- Facilitates the analysis of complex (causal?) relationships such as accumulation of advantage, "small events with large effects" and other types of "path dependency"

- Allows a better understanding of the sequence of events and how they are related to specific outcomes

Typical research questions

- Process analyses are often oriented at "how" questions
- Disclosing or understanding **unique or typical patterns of events** and relating the patterns to "certain antecedents, contexts and outcomes" (Boons et al. 2014:342)
- Understanding or defining **stages** of a process
- Understanding **planned versus emergent** events and the effects of unforeseen events (serendipity, disruption, controversy etc.)
- Understanding the role of events at **different levels** (individual, unit, organisation, network, system) related to a process

Two main empirical approaches

- **Backward approach**: the starting point is a specific outcome and the researcher uses various types of data to understand the processes that led to this outcome

- **Forward approach**: from a more or less well defined starting point (something "new", "stable", "finished"), the researcher seeks to follow the events that come out of it

- Also other options such as counterfactual analysis

- Most impact assessments follow the backward approach, but great potential in more real-time analyses – both need to define **starting point**

Elements of a process methodology

- Ideas about the **outcome of the process** of interest: for our purpose, theoretically and empirically informed ideas about what impact may imply

- Ideas about the **type of events** to be included in the analysis: most often based on theory and earlier research but can also be based on the data

- Ideas about **linkages between events** with categories such as intentional, life cycle based, evolutionary, dialectical and serendipitous linkages

- Ideas about the **context** in which the events take place; scientific field, type of research organisation and sector of use central for our purpose

- *Sources: Boons et al. 2014; van de Ven and Poole (1995); Pettigrew (1990)*

Other aspects

- Need to discuss the "central subject" which is the entity that experiences or creates the events

- Many techniques to ensure reliable coding of events and to analyse linkages in larger datasets quantitatively

- Longitudinal research often requires broad and enduring contact between research and research subject and may require an element of "action research" or other form of engagement

- Process methods and longitudinal research cases are costly and complicated, especially the forward approaches

A process perspective on impact

- The next pages outline steps in a methodology inspired by the wider process literature which we have argued is useful for moving our understanding of research impact further

- Our aim is to understand the process of creating research impact including critical events and their linkages, preconditions and contexts

- Our practical starting point is a long-term research project rather than a policy-sponsored initiative to improve evaluation methods

Empirical approach and unit

- A general need for more forward-looking studies that can include events that are not documented in writing or depend upon actors' memories

- Many studies look at the actions and interactions of researchers, a need to look more closely at the user side

- We suggest that longitudinal real with user organisations or areas original and useful – but will requ

- This can also include a backward bibliometrics

Basic messages:
- Starting point can be a problem or user area rather than research unit
- Combinations of backward and forward approaches can be interesting

Outcomes/pathways

- We know from the impact literature that research has different types of impact for different stakeholders

- May need to select cases that represent different outcomes or pathways, e.g. industrial innovation, policymaking, healthcare

- May need to select empirical **sites** that represent different stakeholders in the process or all a firm, its immediate network an

- Are types of events, linkages, sec across cases that represent differ

Basic messages:
- Process oriented impact cases need to have some ideas about the pathways of interest and include the relevant empirical sites

Events

- The wider literature on research, innovation and impact includes a lot of aspects that can be used to classify events

- Event examples: different forms of interaction, transfer (people, knowledge), contracts/funding, idea generation, operationalisation of need, changes in orientation, feasibility/proof of concept stu

- This can be the starting point

- Events can be tied to aspects

- Coding process should involve greater reliability (and testing

Basic messages:
- Use literature on impact and science to define an initial event coding scheme (to be modified later)
- Coding needs more than one researcher for reliability

Data and analysis

- Events can be found in all types of data

- In longitudinal cases regular interviews, surveys, observation, diaries etc. are often used in combination

- Event coding allows for different process characteristics, such as:
  - Are there typical patterns in which
  - Are there common patterns in how
  - Do event patterns provide new ide development?

Basic messages:
- Normally different types of data are combined in process research
- Techniques and software available e.g. for analysing event sequences

Conclusions

- The general process literature provides us with some new and useful approaches for understanding research impact and for studying it empirically through longitudinal real-time methods

- A process perspective implies a focus on events and the contexts and sequences in which they appear – and defining the set of relevant "events" is a central challenge

- Looking at research impact as a more general social process may open up for new opportunities for cross-disciplinary work as impact and research are seen as something less unique and more similar to other social processes

Thank you for your attention

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