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LEANBH Project

Learning to Evaluate Blood Pressure at Home



IS RESEARCH SEMINAR SERIES

Designing Effective Theory for Research Impact

Challenging our Thinking

15th January, 2016
J.E Cairnes Building, NUIG

SFI Science Foundation Ireland
Infant Irish Centre for Fetal and Neonatal Translational Research
BioScreen HEALTH
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Introduction

Presentation



Goal: To challenge participants to think not just in terms of ‘how’ they build theory but also ‘why’ they build theory.

Today lets focus on the following:

- Research is for impact
- Theory is a cognitive artefact
- Designing Theory for Impact
- Future of Theory Building

Stretching our thinking about Theory …

Research is for Impact

Importance of Research Impact

Two Types of Impacts from Research …

Academic impact is the "*demonstrable contribution that excellent research makes to academic advances, across and within disciplines, including significant advances in understanding, methods, theory and application.*"

RESEARCH COUNCILS UK

Research impact is "*the demonstrable contribution that research makes to the economy, society, culture, … the environment, or quality of life, beyond contributions to academia*".

Australian Government
Australian Research Council

Research for Impact

Research in Ireland Inc



"Excellent research performed in strategically important areas with relevance and impact for the economy and society …"

"We are committed to maintaining a focus on the impact and relevance of research … "

The Innovation 2020 strategy will continue to support excellent research across the full continuum and across all disciplines.

But since 2012, a more focused approach has been adopted in the public funding of research and innovation activity.

Research prioritisation has concentrated the majority of competitive funding on areas deemed likely to yield greatest economic and societal impact.

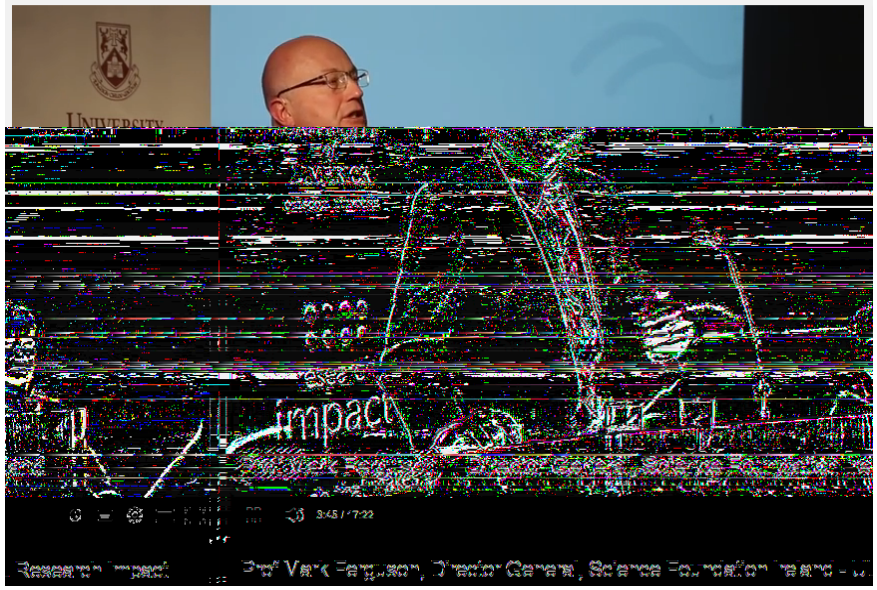
"*Excellence with impact will be the core funding driver*".

Research for Impact

Importance of Research Impact …

"*As with all public spending it is both desirable and necessary to show value for money and within this* ***demonstrate and articulate the impact and benefits of scientific research projects****. In the current climate of constrained public spending there is an even greater* ***focus on demonstrating the economic, social and cultural benefits of publicly-funded scientific research to the wider society*** *…*".

"***SFI will continue to focus on scientific excellence but will now apply an equal focus on impact … and will use experts in the translation, commercialisation and development of scientific research to evaluate research impact as an important and integral part of our review processes***"



Watch at … https://www.youtube.com/watch?v=XmSaWs1mCdA

Science Foundation Ireland

Research for Impact

Making a Research Impact

While the dissemination of research output as publications is very important, in articulating how it will lead to the utilisation of the outputs, applicants should be specific as to why that publication or conference presentation is important, how it ensures the potential beneficiaries have the opportunity to engage with the research, and how this will be followed up.

IMPACT OVERVIEW

SFI Agenda 2020 sets out a vision in which Ireland will, by 2020, be the best country in the world for both scientific research excellence and impact. While SFI continues to focus on scientific excellence, we now apply an equal focus on **impact** across a portfolio of programmes. SFI defines impact as the *"demonstrable contribution that excellent research makes to society and the economy"* SFI classifies the impacts of scientific research according to 8 pillars which are underpinned by 3 thematic areas (see diagram below) SFI defined this framework as part of the Small Advanced Economies Initiative "Broadening the Scope of Impact"



Source: http://www.sfi.ie/funding/sfi-research-impact/impact-webpage.html

Research for Impact

Where do the priorities lay?



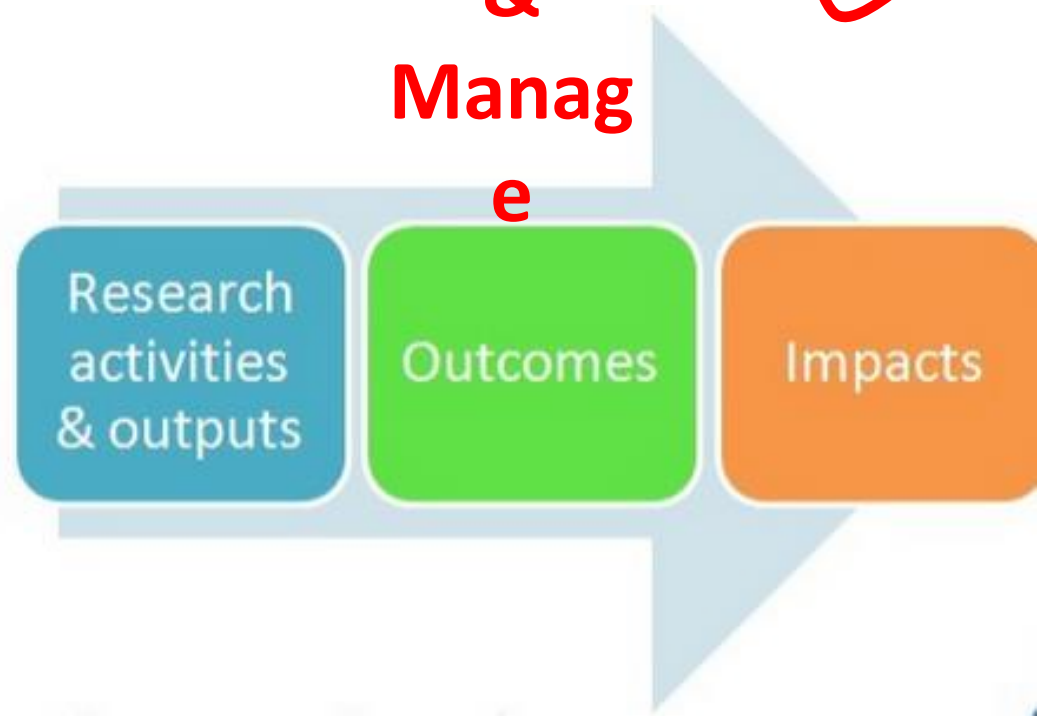
How many mentions of the following words in 36 Pages …

Citation	**1**
Publication	**5**
Impact	**circa 30**

Research for Impact

The Research Value Chain …

Execute & Manage



Research should be 'Designed for Impact'

Design & Plan

Research for Impact

Research Impact Statements …

"***Impact statements*** *should be written primarily in lay non-technical language, be as specific and comprehensive as possible and cover potential impacts by answering the following questions:*

- ***Who will benefit from this research?***
- ***How will they benefit from this research?***"

Source: http://www.sfi.ie/funding/sfi-research-impact/

Science Foundation Ireland

Research for Impact

Rethinking Theory

Role of Effective Theory

Nature of Theory

Theory and theoretical knowledge are human ***creations*** rather than ***discoveries*.** The resulting theories have an existence separate from the subjective understanding of individuals.



Source: http://mw2.google.com/mw-panoramio/photos/medium/8107739.jpg



Source: https://corkarchaeologist.wordpress.com/about/publications/

Source: O'Raghallaigh, P., Sammon, D. and Murphy, C.; (2010) Map-Making and Theory-Building: Principles for Achieving Presentational and Content Effectiveness International Conference on Information Systems (ICIS 2010) St Louis, Missouri, USA, , 12-DEC-10

The ‘Functional’ Perspective

Theory describes, explains and predicts a phenomenon of interest.

The quality of the theory is derived from the accuracy of its relationships as well as the domain or extent of the explanations and predictions.



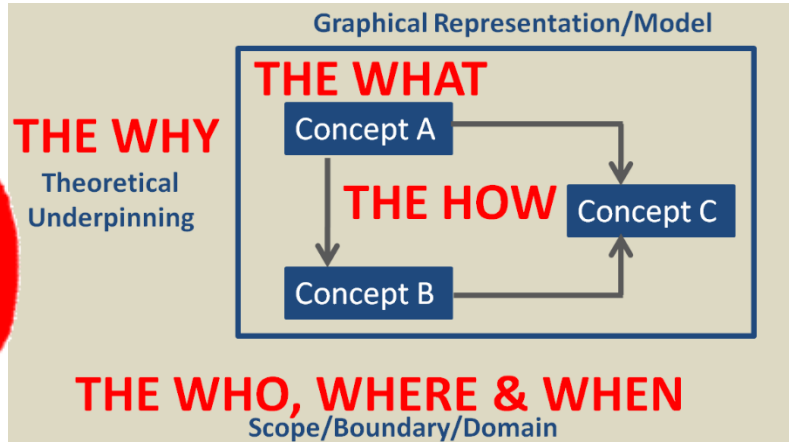
Source: http://static.ibsrv.net/car-pictures/used-car-prices/used-car-engine-price.jpg

Good Theory

The ‘Structural’ Perspective

A theory consists of common features:

(i) factors/constructs (*The What*)
(ii) relationships (*The How*)
(iii) theoretical underpinning (*The Why*),
(iv) scope/boundary/domain (*The Who, Where & When*),



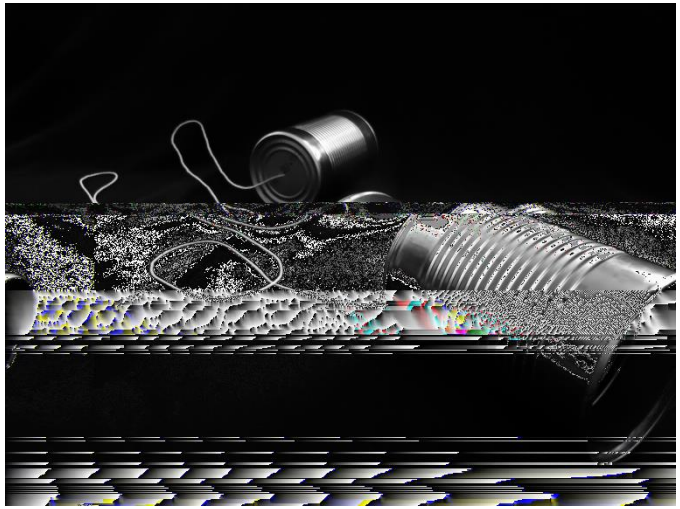
Theory & Not-Theory

Source: Sammon, D., Nagle, T., O¿Raghallaigh, P. and Finnegan, P. ; (2011) Design of a Pedagogical Artefact for Doctoral Researchers to Assess Theoretical Strength The 19th European Conference on Information Systems (ECIS2011) Aalto University School of Economics, Helsinki, Finland, , 09-JUN-11

The ‘Communication’ Perspective

Theory communicates the intricacies of a phenomenon to others.

But communication depends on the effectiveness of knowledge production and knowledge translation.



Source: http://www.pxleyes.com/images/contests/communication-means-2/fullsize/First-communication-4fcd0126d49ea_hires.jpg

Source: O¿Raghallaigh, P., Sammon, D. and Murphy, C. ; (2011) The Design of Effective Theory The International and Inter-disciplinary Workshop on Practice Research Aalto University School of Economics, Helsinki, Finland, , 08-JUN-11

But who are the consumers of Theory

As scholars it is our central mission to develop theories that both contribute knowledge to the academic discipline (i.e. our internal stakeholders) ***and*** apply that knowledge to practice (i.e. our external stakeholders) (c.f. Simon 1967).

Research is salient to the internal stakeholders if it adds to the current theoretical frameworks of the discipline; and to the external stakeholders if it solves the real life problems faced by practitioners (Bakshi and Krishna 2007).



Source: http://blog.lionbridge.com/translation/files/2013/08/Translate-Button-White.jpg

Source: O'Raghallaigh, P., Sammon, D. and Murphy, C.; (2010) Map-Making and Theory-Building: Principles for Achieving Presentational and Content Effectiveness International Conference on Information Systems (ICIS 2010) St Louis, Missouri, USA, , 12-DEC-10

The 'Cognitive' Perspective

Both the production and consumption of theories is not straightforward owing to:

(1) the heterogeneity of those producing and consuming the research;
(2) the cognitive limitations of the human mind;
(3) the ineffective cognitive designs of the theories.

These three factors have limited the impact of our theories and they raise serious questions as to how theories should be produced in order to be consumed more effectively.



Source: http://blog.ganderson.us/wp-content/gla/uploads/2010/06/YinYang-economy.jpg

Effective Theory

Source: O¿Raghallaig[illegible] (2011) The Design of Effective Theory The International and Inter-disciplinary Workshop on Practice Research Aalto University School of Economics, Helsinki, Finland, , 08-JUN-11

Effective Theory

Effective theory is theory appropriate in both its presentation and content for its purpose and intended audience.

The effectiveness of theory is therefore detected from its cognitive impact on the audience. Effective theory focuses on usefulness.

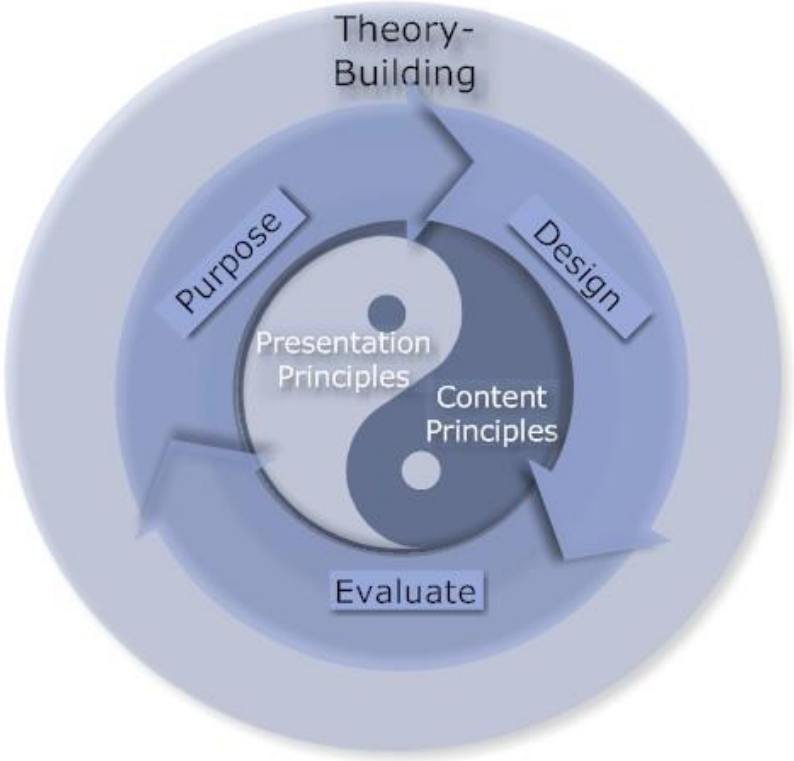


Source: https://happeningpeople.files.wordpress.com/2012/10/istock_000017439285_extrasmall_team-effectiveness.jpg

Source: O¿Raghallaigh, P., Sammon, D. and Murphy, C. ; (2011) The Design of Effective Theory The International and Inter-disciplinary Workshop on Practice Research Aalto University School of Economics, Helsinki, Finland, , 08-JUN-11

Effective Theory Building

Theory Building is inherently iterative and incremental consisting of "… *the purposeful process or recurring cycle by which coherent descriptions, explanations, and representations of observed or experienced phenomena are generated, verified, and refined*" (Lynham 2000 p. 161).



Source: O¿Raghallaigh, P., Sammon, D. and Murphy, C. ; (2011) The Design of Effective Theory The International and Inter-disciplinary Workshop on Practice Research Aalto University School of Economics, Helsinki, Finland, , 08-JUN-11

Designing for Research Impact

The search for impact

Mindset of a Designer



Source: http://www.aggsbach.de/2012/09/black-basalt-handaxe/

- Humble
- Empathic
- Mind of novice
- Facilitatory
- Embrace messiness
- Embrace complexity
- Acceptance of ambiguity
- Focus on value creation
- Use of prototyping
- Use of evaluating
- Tolerant of failure

Start with the ‘So What’?

Research Game: Design the Cover Story

Object? The object of the game is to suspend disbelief and to envision a future state that is so stellar that it landed your research on the cover of a well-known media outlet. The players pretend as though this future has already taken place and has been reported by the mainstream media.

Why? It is a game about imagination, whose purpose is to think expansively around an ideal future state for the organization; it’s an exercise in visioning the future impact of an opportunity. This game is worth playing because it not only encourages people to “think big,” but also actually plants the seeds for a future that perhaps wasn’t possible before the game was played.



So What?

Starts **before** you commence your research journey!

Research Game: Design the Press Release





So What?

Research Game: Design the Box …



Object? The team creates a box for the idea (whether or not it will become a tangible product) as if it is to be sold at retail. Typical box elements include *product name*, *product category*, *tagline*, *key benefits*, and *top features*. Visual elements that set the tone and design direction can also be included.

Why? This game encourages conversation about what really matters. It constrains conversation to a specific format to boost productivity of discussion. It creates a common, tagline touchstone that communicates a shared product vision.

Wow?

Designing for Research Impact

Drill from ‘The What’ into ‘The Wow?’

Research Game: Creating a Research Value Proposition



My research provides: *Outputs*

To: *Stakeholder(s)*

In order to: *Purpose of outputs*

That is different in that: *Differentiators*



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Wow?

Research Purpose

The title of my research is *Research Title*

My research addresses the question of: *Research Question*

RXF Worksheet

Impact

If successful the impact of the research will be to: *Impact factors*

Even if unsuccessful the impact of the research will still be to: *Impact factors*

The limitations of my research are: *Limitations*

The next steps after my research are: *Future Directions*

RXF Worksheet

Lessons Learnt

What I learnt most from my research was: *Personal Lessons*

What others can learnt most from my research is: *External Lessons*

RXF Worksheet

Designing for Research Impact

Research Game: Extracting the Research Value Proposition



My research provides:

Outputs

To:

Stakeholder(s)

In order to:

Purpose of outputs

That is different in that:

Differentiators



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Practice communicating ‘The Wow’?

Research Game: Create the Slidedeck









Create a paper-based slide-deck to include the following slides:

1. The hook
2. The problem
3. The size
4. The solution
5. The research
6. The ‘how’
7. The team
8. …



Putting it together

Designing for Research Impact

Finally move to ‘The How?’



Designing for Research Impact

The Future of Theory

The search for useful actionable answers

Science is increasingly a Team Sport …

Science is entering a phase when "*facts are uncertain, values in dispute, stakes high, and decisions urgent*" (Ravetz, 2004 p. 3). In the future "*assessment of scientific work cannot be left to scientists alone – for in the face of acute uncertainties and unfathomable risks, they are amateurs too"* (Sardar, 2000). Instead there must be an '*extended peer community*', which inevitably leads to a democratization of science (Funtowicz and Ravetz, 1993). This resonates clearly with Snow's (1964) earlier vision of a Third Culture, which would have the potential to fuse knowledge from practice and science in truly creative ways but primarily through state-of-the-art technology (Sui, 2004). The recent history of cartography (and in particular the advent of visualisation) can be viewed in the context of this new paradigm (ibid).

Interactive Theory

Interactive theories, unlike normal theories, are knowledge generation (rather than knowledge reproduction) tools that support both reflection and articulation - the cornerstones of knowledge construction.

Table 47: Differences between Normal Theory and Interactive Theory

	Normal Theory	*Interactive Theory*
	Theory design	Theory use
	Knowledge presentation	Knowledge generation
	Static and public	Dynamic and private
	Presents/communicates public knowledge to describe, explain, predict, and prescribe a phenomenon to a public audience. The audience is presented with a static artefact (often paper based) which is the incarnation of the theory.	Generation of private knowledge through the user exploring a phenomenon. The user interacts with a technical artefact to build a situation-aware theory from a base image.
Theory-Building Process	The theory is produced a priori by a scholar and consumed by an audience. Map-making and map use is separated by time and place. The knowledge is, therefore, frozen at the time the theory is produced.	The base image is produced a priori by a scholar. The theory is co-produced by the user through overlaying the base image with private situation-specific knowledge. The resulting theory can be shared with others. Knowledge generation and consumption is largely simultaneous and real-time.
Role of Technology	Technology is important in the research process and also in the distribution of the theory but less so in its use.	Technology is critical to enabling interactivity between the image and the user. Interactive theory is only made possible by advances in technology.



Source: http://funnyshit.com.au/img/not-my-job-redux.jpg

Doing things right versus doing the right things?

Many Thanks

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