

Welcome to Day 3 of the international course on

Advancing Societal Impact of Social Sciences and Humanities

12, 14, 19, 21 & 26 May 2020





NETWORK FOR ADVANCING & EVALUATING THE SOCIETAL IMPACT OF SCIENCE



DAY 3

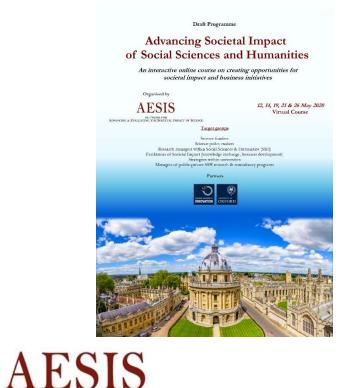


#OXCO20 @AESISNET





OVERVIEW OF THE COURSE



Tuesday 12 May - Introduction, Spin offs and IP policies Mark Mann & Marc Sedam

Thursday 14 May - Identifying and Developing Business Opportunities Frank Zwetsloot & Mikkel Rasmussen

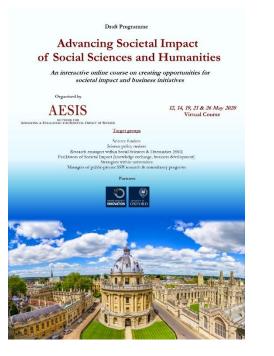
Tuesday 19 May - Implementing an Impact Strategy in your SSH University Unit Thomas König & David Budtz Pedersen

Thursday 21 May - Structures for Mapping and Assessing Impact of SSH Adam Luqmani, Catherine Kerfoot & Alis Oancea

Tuesday 26 May - Consultancy Opportunities for SSH Oliver Cox Case study presentations

#OxCo20

OVERVIEW OF THE PROGRAMME



AESIS

Part 1

Recap Introducing today's theme Thomas König Conditions and Bottlenecks for Structuring an Impact Strategy in your Institute

Part 2

David Budtz Pedersen Creating Business Alliances and Institutional Incentives

Summary of Day 1 – Mark Mann

- Conditions for spinoffs and entrepreneurship
- Multiple pathways for research commercialization: 1) straight to expert consultancy, 2) commercialized at existing company, 3) form new startup/spinoff
- "Academics are being shoehorned into the hard sciences"
- Selling SSH what is being sold often comes in the form of technology, but the knowledge and idea behind the technology is where the value resides





Summary of Day 1 – Marc Sedam

- How to develop IP policies and practice with a focus on SSHA
- Tech Transfer a collaborative, creative endeavor that translates knowledge and research into impact in society and economy.
- Suggestions for SSHA commericalisation:
 - 1. Clear policy on copyright ownership
 - 2. Allow commercialization to be a consideration on promotion and tenure
 - 3. Require "alternative metric" in tracking SSHA project success





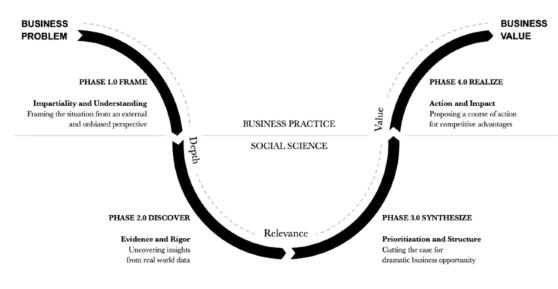
Summary of Day 2 – Frank Zwetsloot

- How to analyze potential and develop potential for impact?
- How are your SSH disciplines related to innovation clusters? Consider your founding history.
- What can SSH add? 1) Add to interdisciplinary approach, 2) Define societal challenge, 3) Advise government policy.
- Does your university deliver infrastructure for SSH?
- Setting up of the World Legal Forum in 1997, an intermediary between academia and society



Summary of Day 2 – Mikkel Rasmussen

- "All big business decisions are bets on human behavior."
- Businesses need SSH to provide deeper insight into the *why's* of human behavior, to look beyond just *what* people are consuming
- Sensemaking when little information is at hand and no hypotheses can be made (e.g. with the COVID-19 situation); utilizing a bottom-up approach, Sensemaking is what SSH can add
- Final comment "Worry less about being nuanced and be less afraid to have a voice and make a change in the world"



FROPRIETARY AND CONFIDENTIAL | 11



Thomas König

Head of Strategy & Scientific Services

Institute for Advanced Studies

Austria





QUESTIONS?





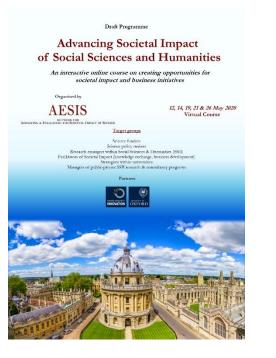
Break

We will be back at 11.15 (BST)





OVERVIEW OF THE PROGRAMME



AESIS

Part 1

Recap Introducing today's theme Thomas König Conditions and Bottlenecks for Structuring an Impact Strategy in your Institute

Part 2

David Budtz Pedersen

Creating Business Alliances and Institutional Incentives



David Budtz Pedersen

Director

Humanomics Research Centre

Denmark







QUESTIONS?





Thank you

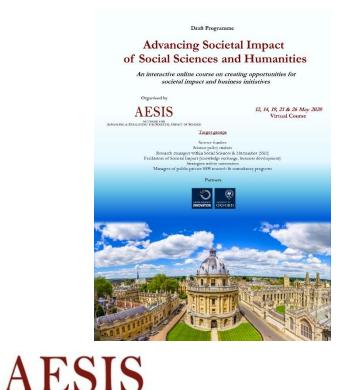
Enjoy lunch!





#OxCo20

OVERVIEW OF THE COURSE



Tuesday 12 May - Introduction, Spin offs and IP policies Mark Mann & Marc Sedam

Thursday 14 May - Identifying and Developing Business Opportunities Frank Zwetsloot & Mikkel Rasmussen

Tuesday 19 May - Implementing an Impact Strategy in your SSH University Unit Thomas König & David Budtz Pedersen

Thursday 21 May - Structures for Mapping and Assessing Impact of SSH Adam Luqmani, Catherine Kerfoot & Alis Oancea

Tuesday 26 May - Consultancy Opportunities for SSH Oliver Cox Case study presentations



Conditions and bottlenecks for structuring an impact strategy

Thomas König



"Learning exercise"

- Input
- Breakout session with guided questions
- Discussion
 - Strategy
 - Impact
 - Context
- Wrap-up



A few words about myself

- Trained in political science, history
- PhD on Fulbright Program (US exchange program)
- Working for the president of ERC
- Head of strategy at IHS



What is "SSH" anyways?

- "Two cultures", three cultures ...
- Invention of bureaucrats (counterpart to STEM)

Integration of **Social Sciences** and **Humanities** in Horizon 2020: Participants, Budget and Disciplines

4th Monitoring report on SSH flagged projects funded in 2017 under the Societal Challenges and Industrial Leadership priorities







When we talk about "the" SSH ...

- it may falselyproject that there is an common (theoretical, conceptual, ...) underpinning
- It may falsely project interdisciplinarity already achieved
- It may falsely project that all disciplines are in the same situation
- It may falsely project the same about institutions

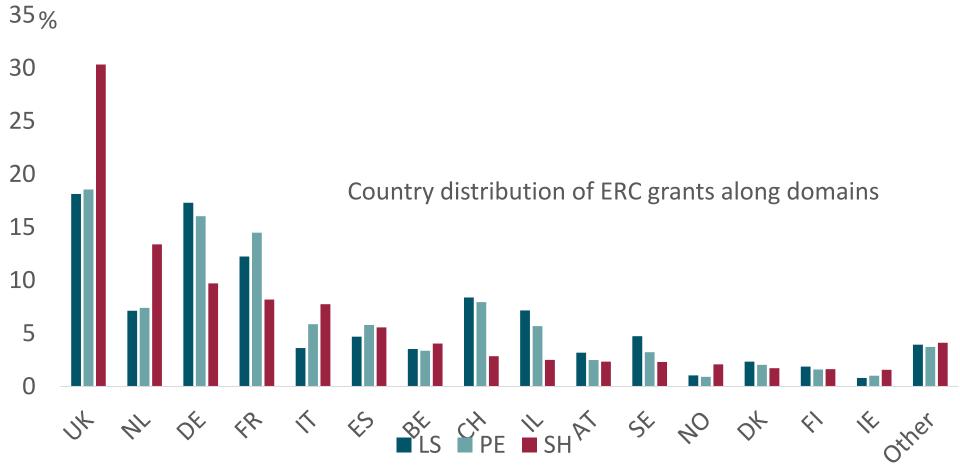


Fig. 2: Analysis of Horizon 2020 advisory panels of six challenges¹⁸

Group	Title	Experts	SSH representatives
E02942	Advisory group for Health, demographic	26	1 economist
	change and wellbeing (SC1)		
E03279	Scientific Panel for Health (SPH)	25	2 economists
E02939	Advisory Group for Food Security,	18	4 economists, 2 social scientists,
	Sustainable Agriculture, Marine and		1 humanist
	Maritime Research and the Bioeconomy		
	(SC2)		
E02981	Advisory Group on Energy (SC3)	23	5 economists, 3 social scientists
E02969	Advisory Group for Smart, green and	23	2 economists, 1 social scientist
	integrated transport (SC4)		
E02924	Advisory Group for Climate Action,	10	3 economists, 1 social scientist
	Environment, Resource Efficiency and		
	Raw Materials (SC5)		

(Put together by the author)







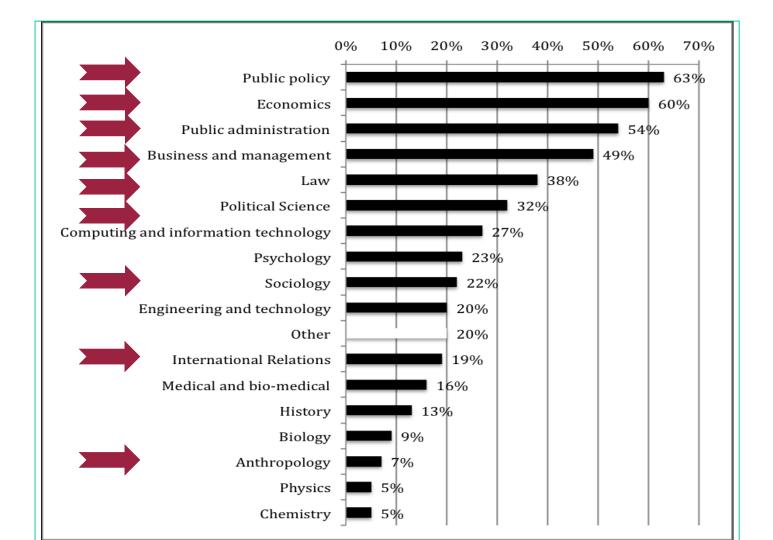
Common features of SSH

- diversity in theories, concepts, methods; inherent tensions
- Disciplinary and regional differences (reputation, resources)
- Context matters (expertise is local, not global/universal)
 - "methodological nationalism"
 - institutions



But why then are social sciences and humanities important?

- Reflective: Accumulating knowledge about societies and cultures
- Practical: Creating meaning and providing evidence for policy-making





Questions for breakout session #1

- What is your role within your unit?
- How good, do you think, is your unit/institution when it comes to SSH?
 - Overall quality (staff, resources)
 - Fields of expertise (disciplines, knowledge)
 - Reputation (standing w/in, recognition, ...)



Discussion

- Context
- Impact
- Strategy





- A strategy is a plan to achieve a goal
- What is the goal? (for whom/what?)
 - Realistic
 - Ambitious

Question: Does your unit/institution have an "(impact) strategy" of some sort?





- Impact implies something to measure (vs. Quality in itself)
- Impact on academic system (metrics) vs.
 Impact on society (much harder to measure)
- Impact vs. Reputation! (the latter often comes with some sort of impact, but it may





- Levels:
 - National, regional, institutional
- Dimensions:
 - Disciplines fields of expertise strengths and weaknesses

Question: How would you describe your context?



Concluding discussion

Learning experience

Take-away message

Thank you for attending, sharing your experience, and discussing the topic!



Building Impact Alliances and Institutional Incentives

David Budtz Pedersen PhD Professor of Impact Studies & Science Communication Aalborg University Copenhagen

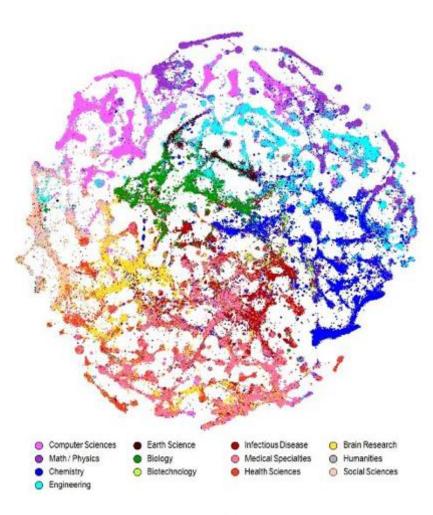
18 May 2020 Oxford University | Worcester College | AESIS course



AALBORG UNIVERSITET

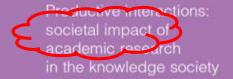
Humanomics Research Centre

- Meta-research unit focused on studying the interdisciplinary and societal impact of research.
- 15 researchers, grants: Velux Foundation, Danish Council for Independent Research, European Commission, Danish Ministry of Science etc.
- Running projects "Mapping the Public Value of Humanities", "Responsible Impact", "Open Science Research Analytics" & H2020 "ACCOMPLISSH"





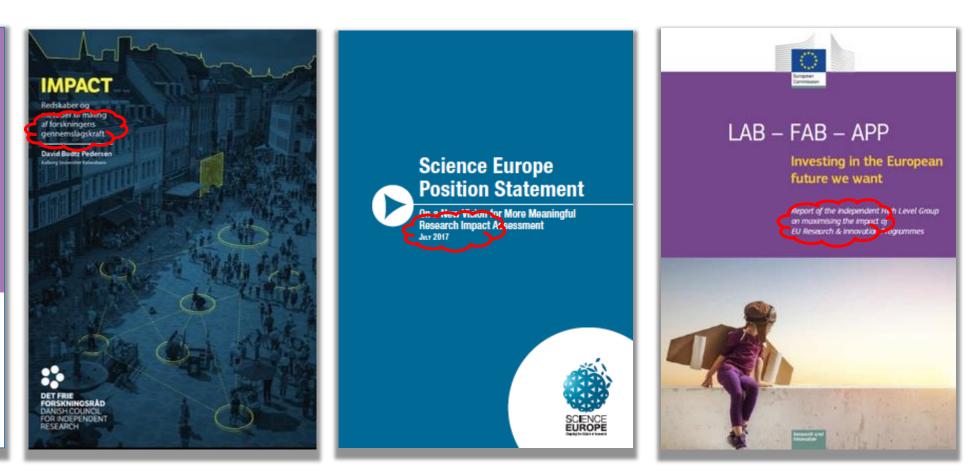




LERU position paper March 2017

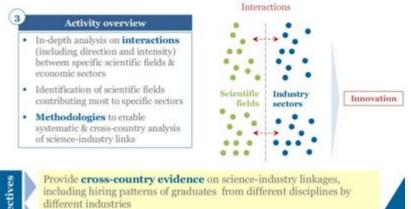


- Dissocial of Manufacture (Consenting & Discourse): Forwards of Samoniga - Dissocial and Dissocial - Dissocial of Distocial - Dissocial of Dissocial - Dissoci



A hot topic in SSHA

Assessing the contributions of specific scientific disciplines to industrial innovation



Discuss methodologies for best conducting such assessments



UiO University of Oslo

D Search For employees Norwegian website

OSIRIS - Oslo Institute for Research on the Impact of Science

A part of TIK Centre for Technology, Innovation and Culture at Faculty of Social Sciences

Lienes Neuro Evente Alexut



R-QUEST Center for Research Quality and Policy Impact Studies **PEOPLE & ORGANISATIONS** CONTAC HOME RESEARCH PUBLICATIONS EVENTS NEWS

RESEARCH QUALITY AND POLICY IMPACT

Quality in research is a highly prioritized, but also a much debated issue in research policy. The Centre for Research Quality and Policy Impact Studies (R-QUEST) constitutes an 8-year commitment to explore the nature and mechanisms of research quality - funded by the RCN FORINNPOL initiative. The centre will address three closely related questions:

summer programme under grant agreement he

ACCOMPLISSH

ACcelerate CD-contion by setting up a Multi-actor PLatform for Impact from Social Sciences and Humanitie



Agenda for this session



The four I-s of Research-Business Impact

- 1. INVESTING IN IMPACT. Alignment of mission statement (strategy/values) impact profile and indicators.
- 2. INCENTIVES. Without emphasis on incentives, recognition, and impact awards, most research-2-business activities in SSHA will not occur.
- 3. INTERMEDIARIES. Roles and skill-sets needs to be cultivated and updated with on-demand services, training and knowledge hubs/brokers.
- 4. **INFRASTRUCTURE**. Better, more robust data about impact activities used to learn from best practices and inform new strategies and instruments.



Humanomics Research Centre 2019

Part 1 Impact investment



Impact Investing

- Investments "made into companies, organizations, and funds with the intention to generate measurable, beneficial social or environmental impact" alongside and beyond financial return." (2017 Annual Impact Investor Survey)
- Provides resources for researchers to create companies, collaborate or co-create solutions, which fall within the university's attempt to address societal challenges.
- Impact investing can help organizations carry out their projects and initiatives without having to rely heavily on subsidies or venture capital e.g. philanthropy.



Impact Investing

- Building an impact investment culture in SSH is crucial for the success of any attempt to commercialize research output & partnerships.
- Impact investing universities actively seek to address societal issues by creating new or collaborating w./ established businesses (service, consultancy, ICT, healthcare, education etc.).
- Proactive strategies include creating an entrepreneurial culture (MA, PhD), knowledge transfer, research parks, capacity-building



Impact Investing

"The world's biggest global problems are attracting impact investments. There is a wide variety of problems that needs addressing these include the social issues such as humanitarian crisis of refugees, alleviating the impact from climate change, reducing pollution, addressing ocean plastics, transforming our energy system or sustainable ways of food production, to providing access to quality education and healthcare."

Forbes (Dec 31, 2018)



McKinsey Quarterly

A closer look at impact investing

February 2018 | Article





JUL 29, 2015 @ 09:45 AM 973,617 VIEWS

That 'Useless' Liberal Arts Degree Has Become Tech's Hottest Ticket



George Anders, CONTRIBUTOR I write about innovation, careers and unforgettable personalities.**FULL BIO** ~

Opinions expressed by Forbes Contributors are their own

This story appears in the August 17, 2015 issue of Forbes. Subscribe

Continued from page 2

TWEET THIS

- software companies are discovering that liberal arts thinking makes them stronger.
- yeople without a tech degree may already be benefiting the most from tech's boom

Such hand-holding isn't cheap. Facebook spent \$620 million on sales and marketing in the first quarter of 2015, nearly double from a year earlier. But the payoff for restoring human contact has been vast. Facebook's ad business, which was tiny in the days when everything was automated, now tops \$12 billion a year and is growing more than \$1







IS IT A ³IRD

We turn human understanding into business models*



See what we do in one minute

At IS IT A BIRD we help global companies and organisations make better decisions. Using a human-centered approach we change markets, transform companies and shape the products of tomorrow. We turn human understanding into new opportunities.

Part 2 Incentives



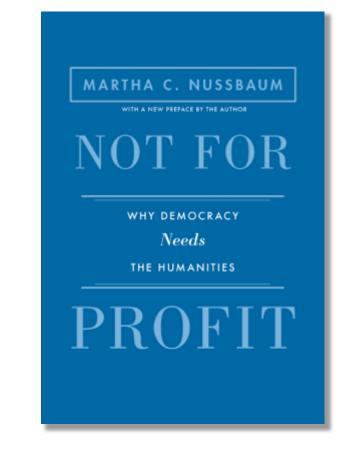
Incentives, Rewards and Purpose

Purpose and practical research objectives	Important	NA/	Unimportant
Produce knowledge for the benefit of teaching, enlightenment and the public good	80 %	19 %	2 %
Produce critical analysis and societal change	65 %	24 %	11 %
Enhance conditions for inter-cultural dialogue and understanding	51 %	35 %	15 %
Enhance conditions for public decision-making and public policies	36 %	40 %	24 %
Contribute to preservation of tradition and cultural heritage	33 %	36 %	32 %
Contribute to business development and commercial skills	3 %		

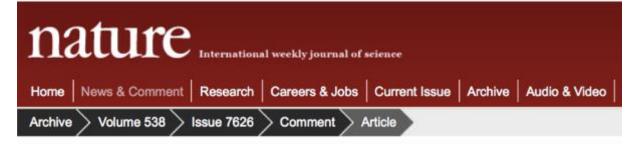
Humanomics Research Centre 2015 n=1071 Humanities scholars

Incentives, Rewards and Purpose

- Building an impact culture / impact literacy
- Getting SSHA on board in entrepreneurial activities incl. support, incubation, acceleration
- Strong identity in SSHA of public good character of knowledge production
- Alignment of research portfolio, reward system and institutional culture







~

NATURE | COMMENT

Fewer numbers, better science

Rinze Benedictus, Frank Miedema & Mark W. J. Ferguson

26 October 2016

Scientific quality is hard to define, and numbers are easy to look at. But bibliometrics are warping science — encouraging quantity over quality. Leaders at two research institutions describe how they do things differently.

🖄 PDF 🛛 🔍 Rights & Permissions

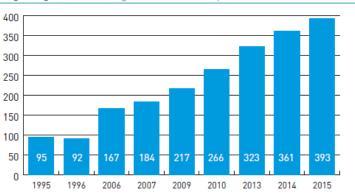
Subject terms: Research management

"Publications that directly influence patient care are weighted no higher in evaluations than any other paper, and less if the work appears in the grey literature (official reports rather than in scientific journals). Researchers are actively discouraged from pursuing publications that might improve medicine but would garner few citations. ... Publication pressure is keeping scientists from doing what really matters"



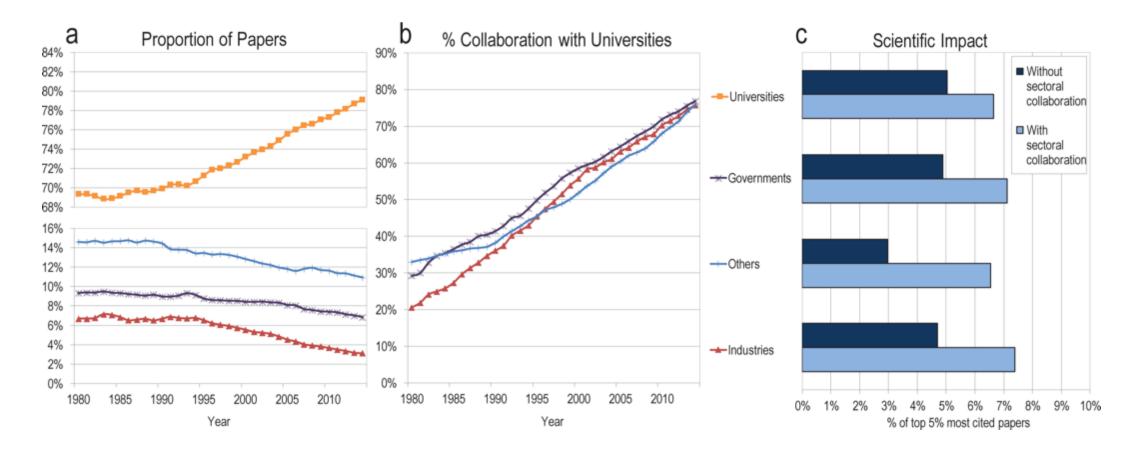
Mobility of researchers

- Many different ways of producing tangible business impact in SSHA
- Interactions with industry: start-ups, fellowships, special grants, visits, consultancy, joint appointments, co-creation, cost-sharing, collaboration, alliances, research parks etc.
- New positions tailor-made for collaborative research: "clinical" humanities, knowledge brokers.



Bilag 2, Figur 10: Udviklingen i antal kliniske professorater

Kilde: Uddannelses- og Forskningsministeriet



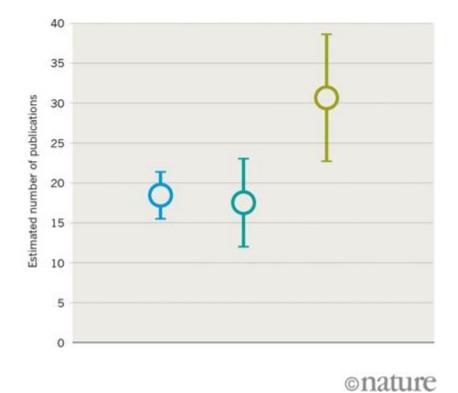
Larivière V, Macaluso B, Mongeon P, Siler K, Sugimoto CR (2018)



PUBLICATION BOOST

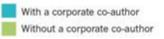
Academic scientists who collaborate with large established firms publish more papers.

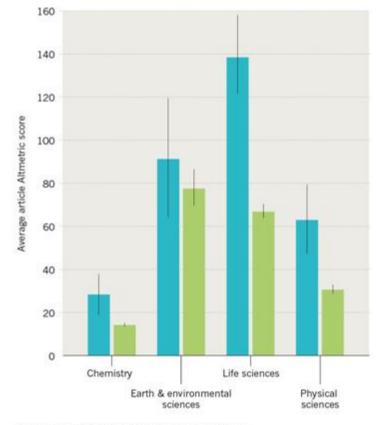
- O No industry collaboration
- Collaboration with a startup
- O Collaboration with an established company



INCREASED CHATTER

Papers authored by academic researchers in 2016 were more widely publicised when they had a corporate co-author, as measured by their Altmetric Attention Score. The Altmetric score tracks the discussion around a published paper, from news articles to blog posts and tweets.







Nature 552, S11-S13 (2017)

onature

The permeable university

Permeability is the new lens which should reframe the purpose of universities in the 21st century

The permeable university is one where all barriers to engagement are removed, both within the institution and around it.



21st Century Lab



The Ohio State University

The Discovery Themes provide Ohio State with an unprecedented opportunity to find durable solutions to today's—and tomorrow's—most compelling global issues.



Chronic Brain Injury

Advancing the prevention, detection, and treatment of brain injuries to relieve the human and economic burdens they cause.

LEARN MORE



Foods for Health

Integrating food, nutrition and metabolomics for a healthier future.

LEARN MORE



Food and AgriCultural Transformation (InFACT)

New thought for sustainable systems to produce and distribute food as we confront climate change, shrinking resources and a growing population.



Global Arts + Humanities

Breaking down barriers to meaningful collaboration and creating an inclusive culture that empowers faculty, staff and students to foster social change

LEARN MORE



Infectious Diseases

Toward a world free from the threat of infectious diseases.

LEARN MORE



Materials and Manufacturing for Sustainability

New materials and manufacturing innovation accelerating global sustainability.



Sustainable and Resilient Economy

Integration of science, engineering, humanities and the arts to enable a global transition to an equitable and prosperous society.



Translational Data Analytics

Connecting complex data sets to advance education, business, and communities.

Knowledge exchange is domain-specific



Knowledge Exchange in the humanities in Denmark

"The survey shows that a large part of humanities scholars at Danish universities actively participate in knowledge exchange and collaboration. 82 per cent of faculty has collaborated with actors and institutions outside academia within a reference period of three years"



Budtz Pedersen et al. 2018 Humanities Impact Survey 1371 respondents







Public Governance and Agencies



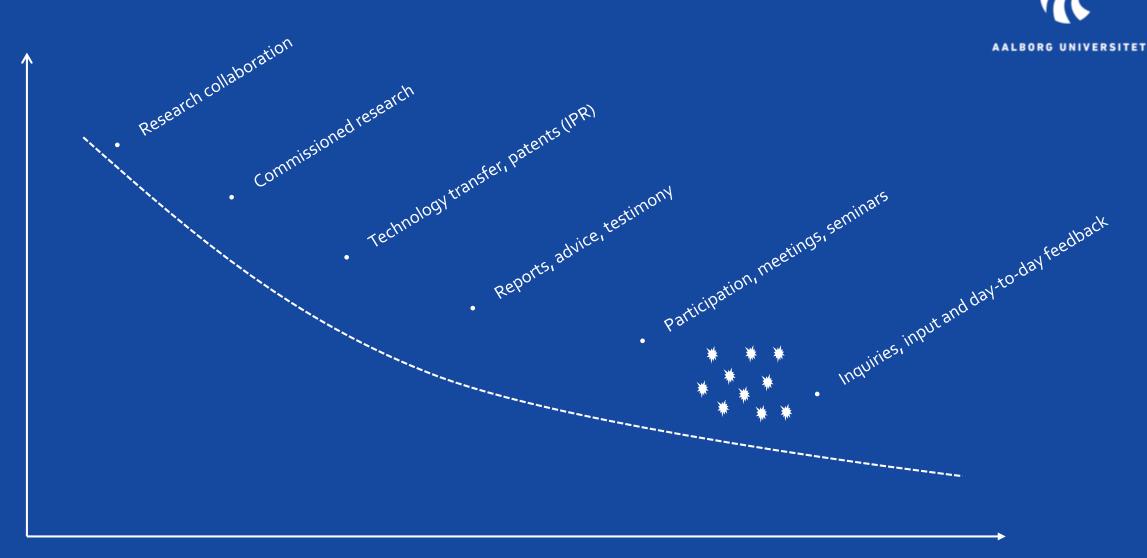
O°C



303 **26,59%** Media, Production and Service Companies

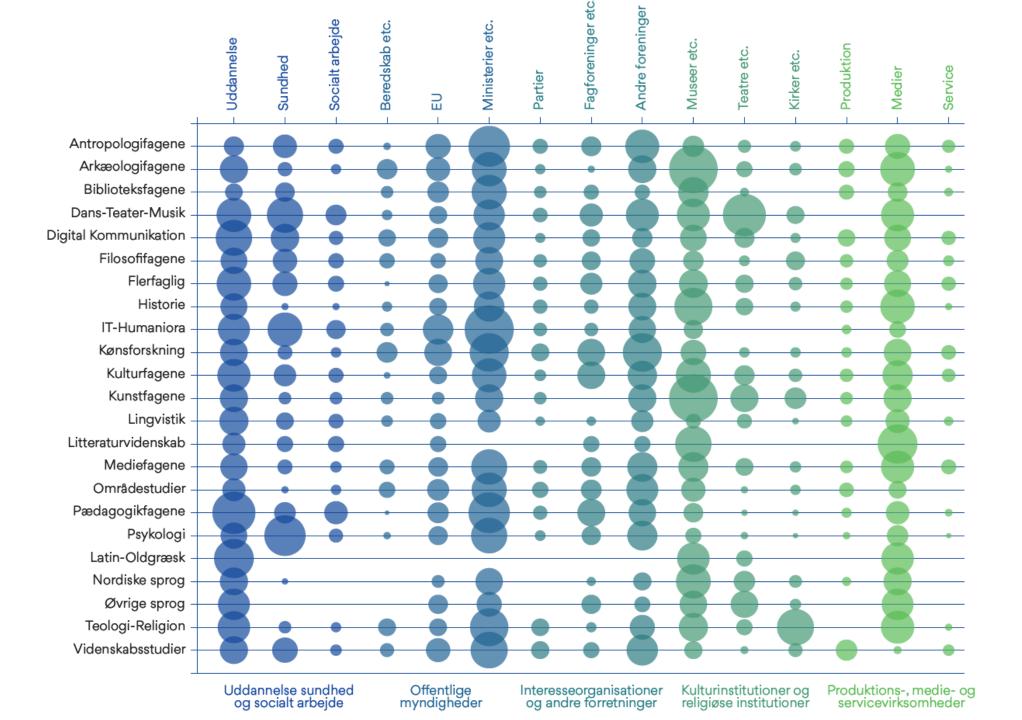
> Budtz Pedersen et al. 2019 n=1371 humanities scholars





Knowledge Exchange

Budtz Pedersen et al. 2019 Humanities Impact Survey 1371 respondents



Part 3 Intermediaries



Build 'productive interactions'

- Throughout the research process
- Skips knowledge dissemination and linear notions of 'uptake'.
- Continuous involvement.
- No gap to bridge
- Build boundary skills / promote knowledge brokers / organisations





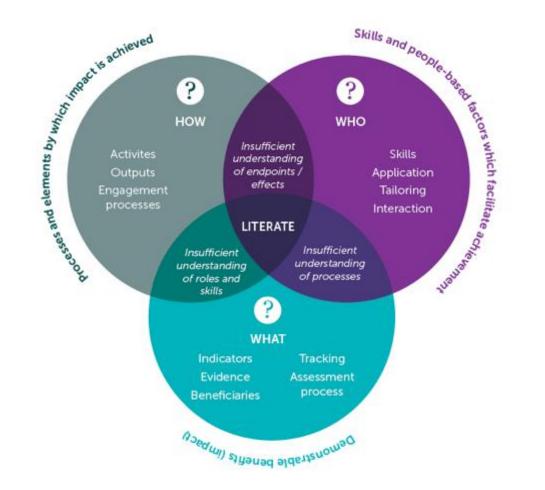
Intermediaries

Relationships based on mutual understanding and trust

- Learning process between the partners to align different motivations, needs, goals
- Importance of good communication and continuity for solid relations

Appropriate knowledge translation

Good co-creation pays off in more than one way Importance of "organisational champions"





Knowledge brokering

- Skills to enable impact:
 - Collaborative skills Public Engagement skills Impact Management Entreprenurial skills
- Interpersonal and dialogue skills
- Understanding stakeholder's logic
- Build 'boundary' skills / brokers



Group discussion 15 minutes What are the most important KE skills for realizing the impact of SSH?

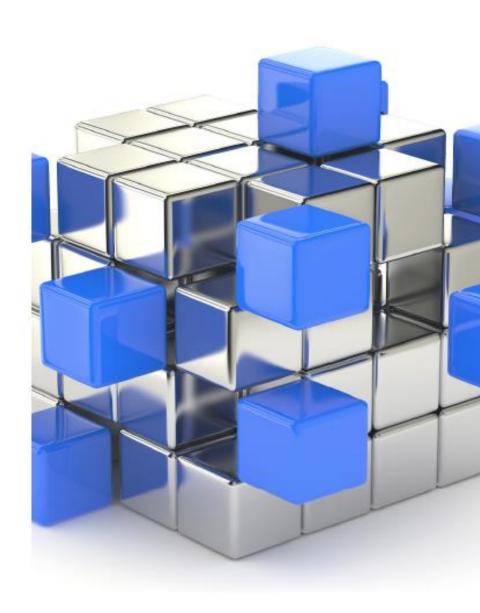


Part 4 Infrastructure

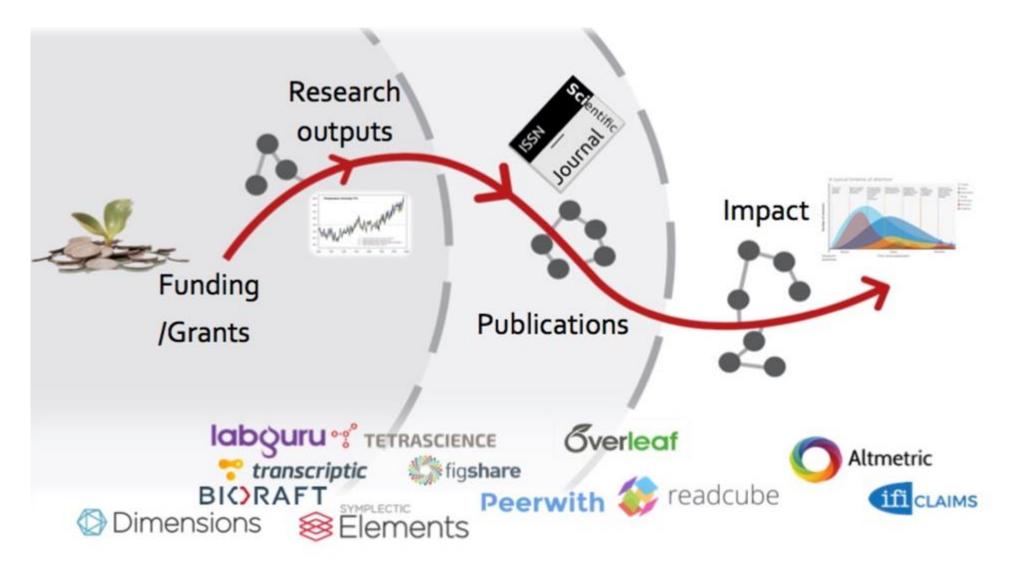


Infrastructure

- Better, more robust data about impact activities for SSH
- Capacity Building & Vocational Training for SSH researchers
- Expanding Knowledge Exchange formats, networks and platforms.
- Impact management (incl. different transactions models)

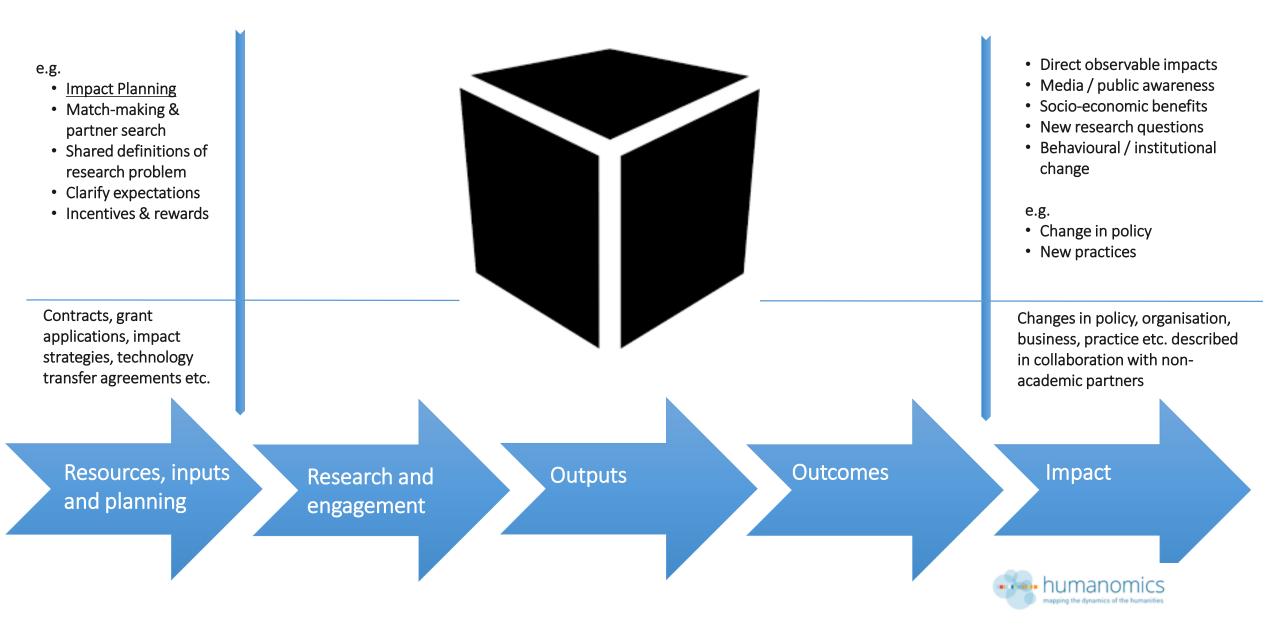


Realizing the impact value chain



EX ANTE

EX POST



EX ANTE

RESEARCH BENEFITS

INTERACTIONS

IMPLEMENTATION

EX POST

 e.g. <u>Impact Planning</u> Match-making & partner search Shared definitions of research problem Clarify expectations Incentives & rewards 	e.g. • Co-production of new knowledge • Deeper partnerships • New methods • New tools • New research questions	e.g. • Publications • Conferences and seminars with stakeholders • Social media • Media & public awareness • Artefacts & exhibits • IP including patents	e.g. • Contextualizing results • Best practices established • Practical recommendations • Networks and relationships • Science & Policy Advise	 Direct observable impacts Media / public awareness Socio-economic benefits New research questions Behavioural / institutional change e.g. Change in policy New practices
Contracts, grant applications, impact strategies, technology transfer agreements etc.	Openness, accessibility, increased knowledge base, sharing findings,	Dissemination of outputs through scholarly & non- scholarly channels	Benefits for stakeholders, enhanced Impact Readiness, contributions to practice	Changes in policy, organisation, business, practice etc. described in collaboration with non- academic partners
Resources, inputs and planning	Research and engagement	Outputs	Outcomes	Impact
				humanomics mapping the dynamics of the humanities

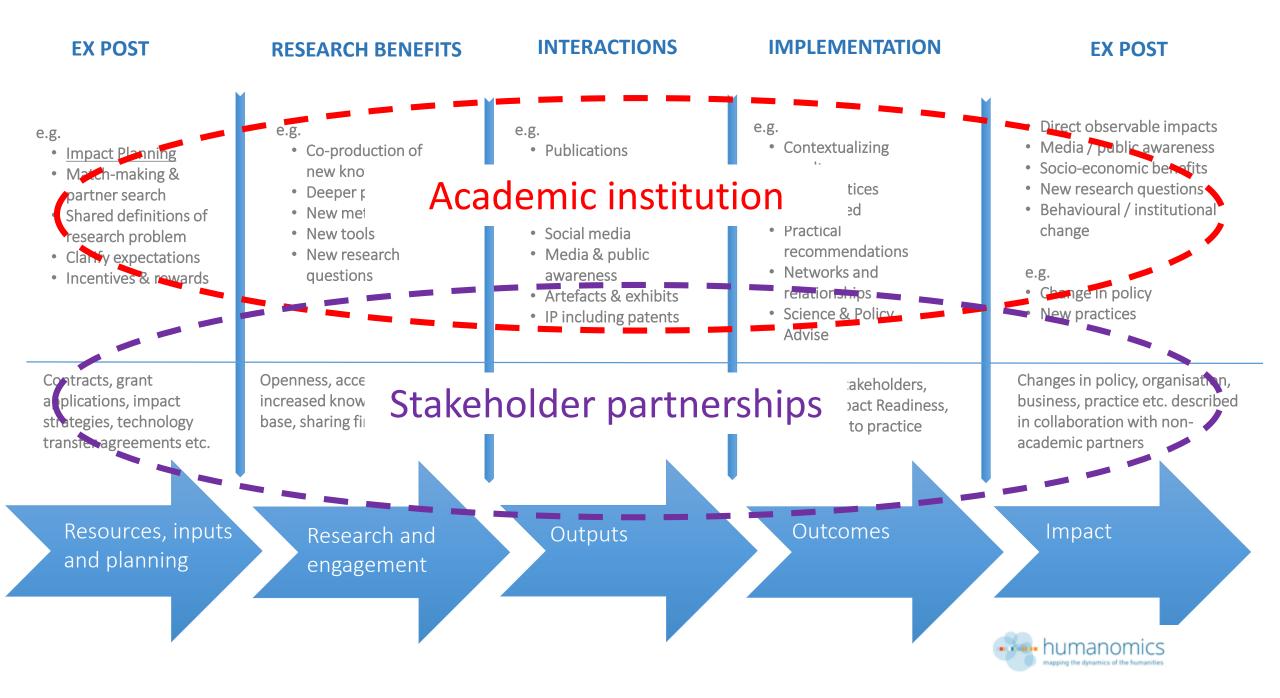
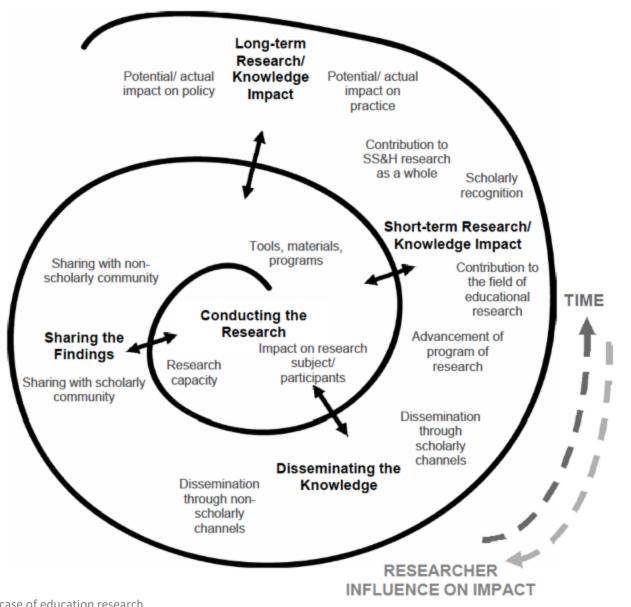


Figure 1 Conceptual Framework of Research Impact in the Field of Education





Amo, C. 2007. Conceptualizing research impact: the case of education research. The Canadian Journal of Program Evaluation 22(1):75-98

ViVO / ReACT Impact Platform

📻 https:/	/vivo.a	au.dk/admin/spar	https://vivo.a	au.dk/admin/span	https://vivo.aau.dk/admin/spar	Hvidtfeldt, Rolf	×	+					
← → (c	https://vivo.aa	u.dk/display/n360						Q	\$	۵	θ	Ē
RE ACT		Home	People	Input	Log out								

Admin Panel

Edit this individual

Verbose property display is off | Turn on

Resource URI: http://vivo.mydomain.edu/individual/n360



The second secon

mai	n.edu/individual/n36	60					
	Participation	Products	Inflow	Other			
	Academic Even	t 🕒					
	seminar						
	Research seminar	m. Rolf Hvidtfelt (05.12), Spea	ter 2018 🏢			
	ReAct: Internat (1617.08), Participant 2018						
	meeting						
	Gruppemøde, Pub	ic Value of the Hu	umanities d. 0	2.11.18, Participant 2018	W		
	Meeting with Assoc	ciate Vice Chance	ellor at UC Da	vis (12.06.), Participant 20	18 🔟		
	Meeting with profe	ssor at UC Berkel	ey (09.06), P	articipant 2018 📺			

Gruppemøde, Public Value of the Humanities d.13.04.18, Speaker 2018

presentation

Oplæg v. Brook Struck (10.09), Participant 2018 III

Conclusions

- We need healthy, connected institutions
- Fund and build infrastructures to enable Knowledge Exchange in SSH
- Microshifts (activities, interactions, relations) do not tell the full story about 'change' or 'effect' (attribution) but about »contributions«
- ReAct Indicators provide data of what researchers can do, and what KE professionals can advise them to do.



Group discussion 10 minutes

How can universities support impact assessments that "feed in to the R&D process" rather than evaluating it



Thank you for the attention

David Budtz Pedersen: davidp@hum.aau.dk Twitter: @HumanomicsMap Website: <u>http://mapping-humanities.dk</u>

Supported by

VELUX FONDEN



Research Evaluation, 29(1), 2020, 4-21 doi: 10.1093/reseval/rvz033 Special section

Methods for mapping the impact of social sciences and humanities—A literature review

David Budtz Pedersen*, Jonas Følsgaard Grønvad and Rolf Hvidtfeldt

Humanomics Research Centre, University of Aalborg, A.C. Meyers Vænge 15, Copenhagen DK-2450, Denmark

*Corresponding author. Email: davidp@hum.aau.dk.

Abstract

This article explores the current literature on 'research impact' in the social sciences and humanities (SSH). By providing a comprehensive review of available literature, drawing on national and international experiences, we take a systematic look at the impact agenda within SSH. The primary objective of this article is to examine key methodological components used to assess research impact comparing the advantages and disadvantages of each method. The study finds that research impact is a highly complex and contested concept in the SSH literature. Drawing on the strong methodological pluralism emerging in the literature, we conclude that there is considerable room for researchers, universities, and funding agencies to establish impact assessment tools directed towards specific missions while avoiding catch-all indicators and universal metrics.

Key words: research evaluation; impact assessment; social sciences and humanities; literature review

Introduction

Across the international research and innovation community there is a growing interest in how to assess and communicate the diverse impacts of scholarly work. Being able to demonstrate the societal uptake and value of social sciences and humanities (SSH) research is increasingly seen as a crucial component in ensuring accountability and transparency (Penfield et al. 2014; Morton 2015; Greenhalgh et al. 2016; Ravenscroft et al. 2017). In recent years, the notion of 'research impact' has gained significant traction within the science system, and has been embedded in research policies, funding instruments, and evaluation regimes (e.g. Rip 2000; Holbrook and Frodeman 2011; Bornmann 2013; Buchanan 2013; Langfeldt and Scordato 2015; Derrick and Samuel 2017; Holbrook 2017; Reale et al. 2017). In this article, we provide an overview of the existing methods for broader impact assessments across SSH.

A key finding of the literature review is that different funding European SSH community and beyond. The diversity of the impact (Morton 2015), However, rather than being paralyzed by the lack

For permissions, please email: journals.permissions@oup.com

agenda in SSH reflects a broader trend within impact studies. The evolution of impact studies has shown that public research organizations do not just release their benefits to society following a linear model of growth and application. Instead, real-world effects of research occur at different stages in the research process, extending from knowledge dissemination and knowledge mobilization to longterm applications and dynamic effects.

Much progress has been made in measuring both the outcomes of research and the processes and activities through which these are achieved (Greenhalgh et al. 2016). However, as we demonstrate in this article, there exists a multitude of approaches to impact assessment reflecting the complex and multi-dimensional ways in which research is taken up by society. As Rafols (2017) noted at the Science, Technology, and Innovation Indicators Conference in 2017: The contributions of science to society are so varied, and mediated by so many different actors, that indicators used in impact assessagencies, policy-makers, and research organizations operate with ment cannot be universal. Instead, they need to be developed for different models and methods for impact assessment. Impact simply given contexts and used alongside qualitative assessment'. Assessing does not mean the same thing across institutions, geographies, and the impact of social science and humanities is indeed challenging. research cultures. This conceptual diversity is reflected in the num- The ways in which research is taken up, used, and reused in realber of methods and frameworks which are used to track, demon- world settings mean that linking research processes or outputs to strate, assess, and incentivize the impact of research across the wider changes is difficult, and timescales are hard to predict

© The Author(s) 2020, Published by Oxford University Press, All rights reserved