Training Science and Society to Engage

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19 June 2023
AESIS Impact of Science Conference | Halifax

AALBORG UNIVERSITET

Programme

Creating a 'social contract' between researchers, supporting staff, policymakers and societal actors to strengthen connections

David Budtz Pedersen (moderator) Professor, Science Communication & Impact Studies, Humanomics Research Centre, Aalborg University, Denmark

Rhonda Moore Executive Director, Science & Innovation, Institute of Governance, Canada

Sandra Lapointe Professor, Philosophy, McMaster University, Canada

David Budtz Pedersen
Professor of Science Communication
Aalborg University

Head of Humanomics Research Centre

Science Policy Adviser, Danish Government
Chair of EU COST Expert Group on Science Communication
Knowledge Broker for Algorithms, Data and Democracy (2021-2030)

Impact strategy and assessment

Four "I"s of Research Impact

1. **INVESTING IN IMPACT**. Alignment of mission and impact strategy ('theory of change') at university & funding agency level.

2. **INCENTIVES**. Without emphasis on incentives, recognition and rewards, most societal impact activities will not occur.

3. **INTERMEDIARIES**. Professional support and specialist skill-sets, training and needs to be cultivated and provided by knowledge brokers.

4. **INFRASTRUCTURE**. Reliable and responsible impact assessment depends on data about impact to learn from best practices and shape new strategies

humanomics
mapping the dynamics of the humanities

"I believe in a research culture that recognises a **diversity of contributions** to science and society; that celebrates high quality and impactful research; and that values sharing, collaboration, integrity and engagement with society, transmitting knowledge from generation to generation."

Mariya Gabriel, EU Commissioner for Research & Innovation

"**The evaluation gap** is the phenomenon… that the criteria in assessments do not match the character or goals of the research under evaluation or the role that the researcher aims to play in society."

Wouters 2014

SCIENCE **DIPLOMACY**

POSITION STATEMENT
SCIENCE COMMUNICATION FOR GREATER RESEARCH IMPACT
2022

SCIENCE
EUROPE
Shaping the future of research

AGREEMENT ON REFORMING RESEARCH ASSESSMENT

20 July 2022
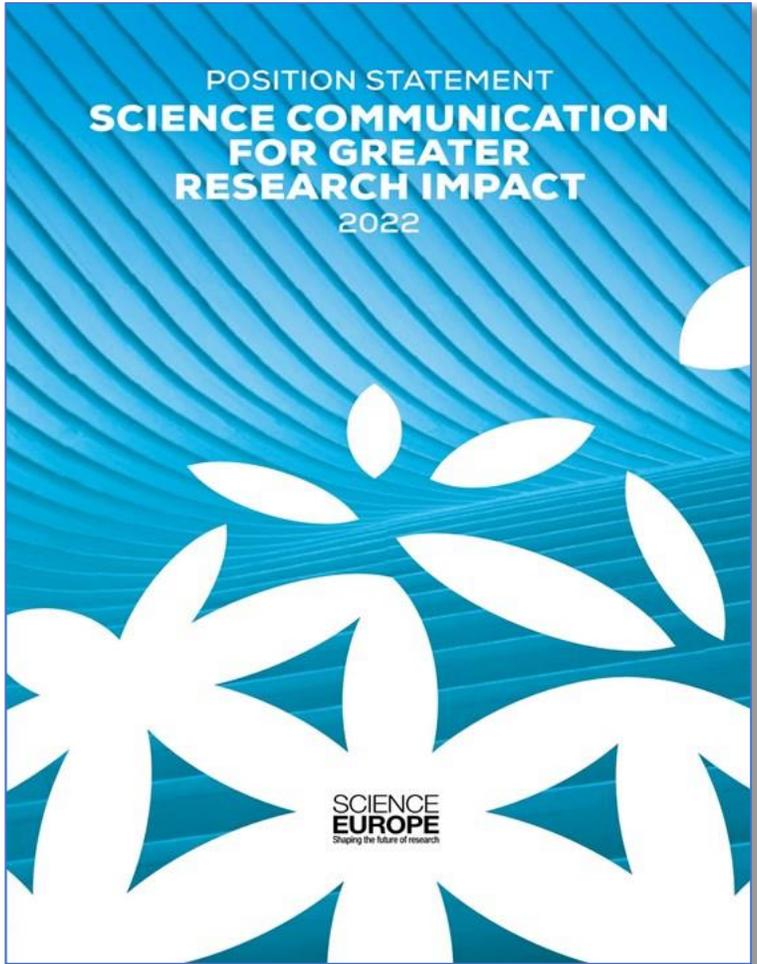
"In addition to traditional academic expertise and track-record, interdisciplinary teams often require experts in knowledge integration, facilitation and implementation that represent an emergent form of expertise beyond disciplinary excellence" (Pedersen & Hvidtfeldt 2021)

Impact training programmes (2022-23)

Training for impact is required throughout the career across PhD, tenure, and academic leadership

Interdisciplinary Leadership Course, Aalborg University, 90+ professors trained for knowledge integration and mobilisation (4 days).

Industrial PhD Course (2019-2022), Innovation Fund Denmark, 120 PhD students trained in impact management and science communication (1 day).

Crown Princess Mary Centre, University of Copenhagen, 45 mid-career researchers trained for knowledge exchange and brokering (2 days).

Mission Masterclass, Support and administrative university staff trained for knowledge exchange and mission-oriented research and innovation (1 day)

humanomics
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You Don't Need a Breakthrough, You Need a Microshift

Specificity of impact

Knowledge exchange

- Research collaboration
- Commissioned research
- Technology transfer, patents (IPR)
- Reports, advice, testimony
- Participation, meetings, seminars
- Brokering, input and day-to-day feedback

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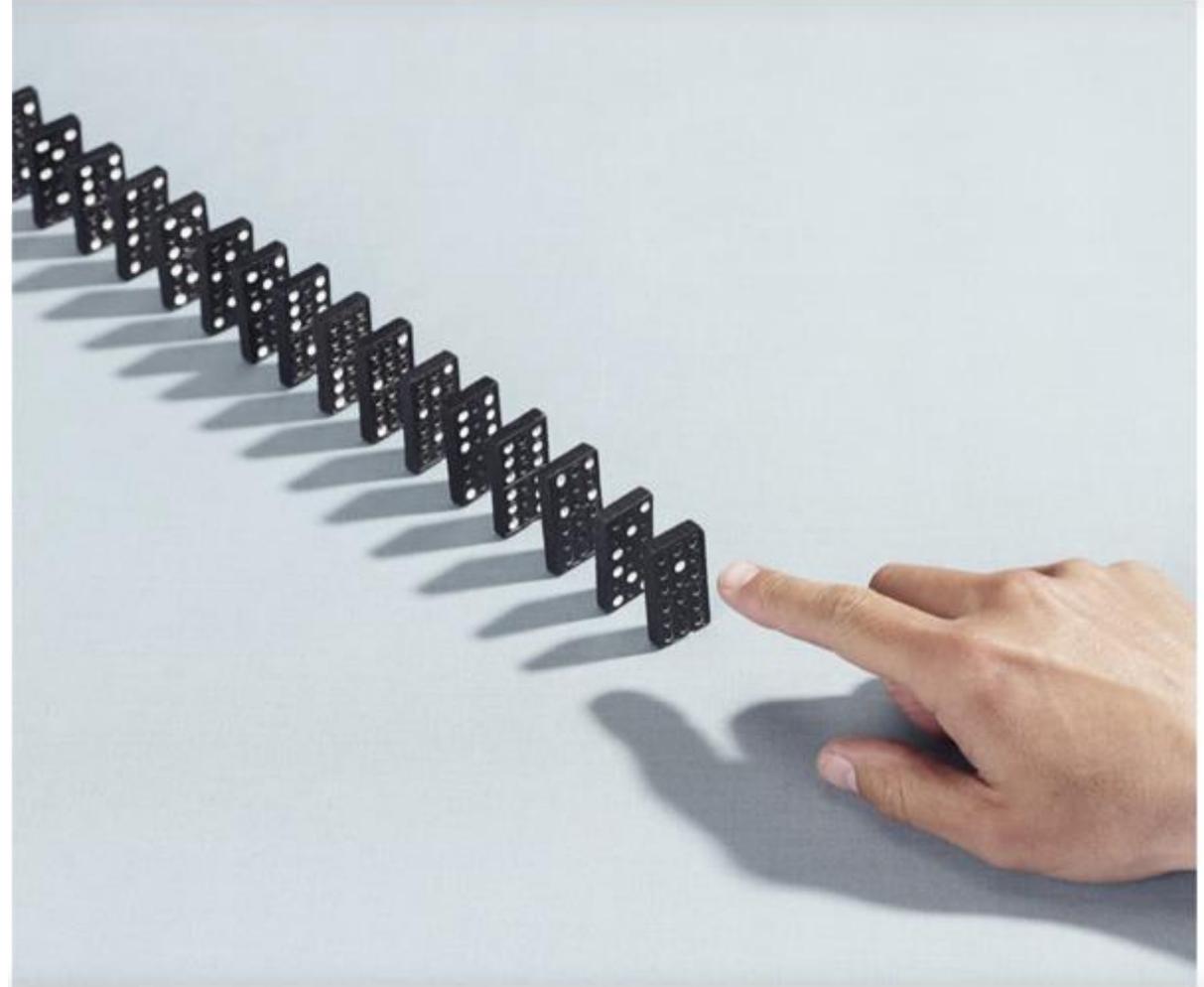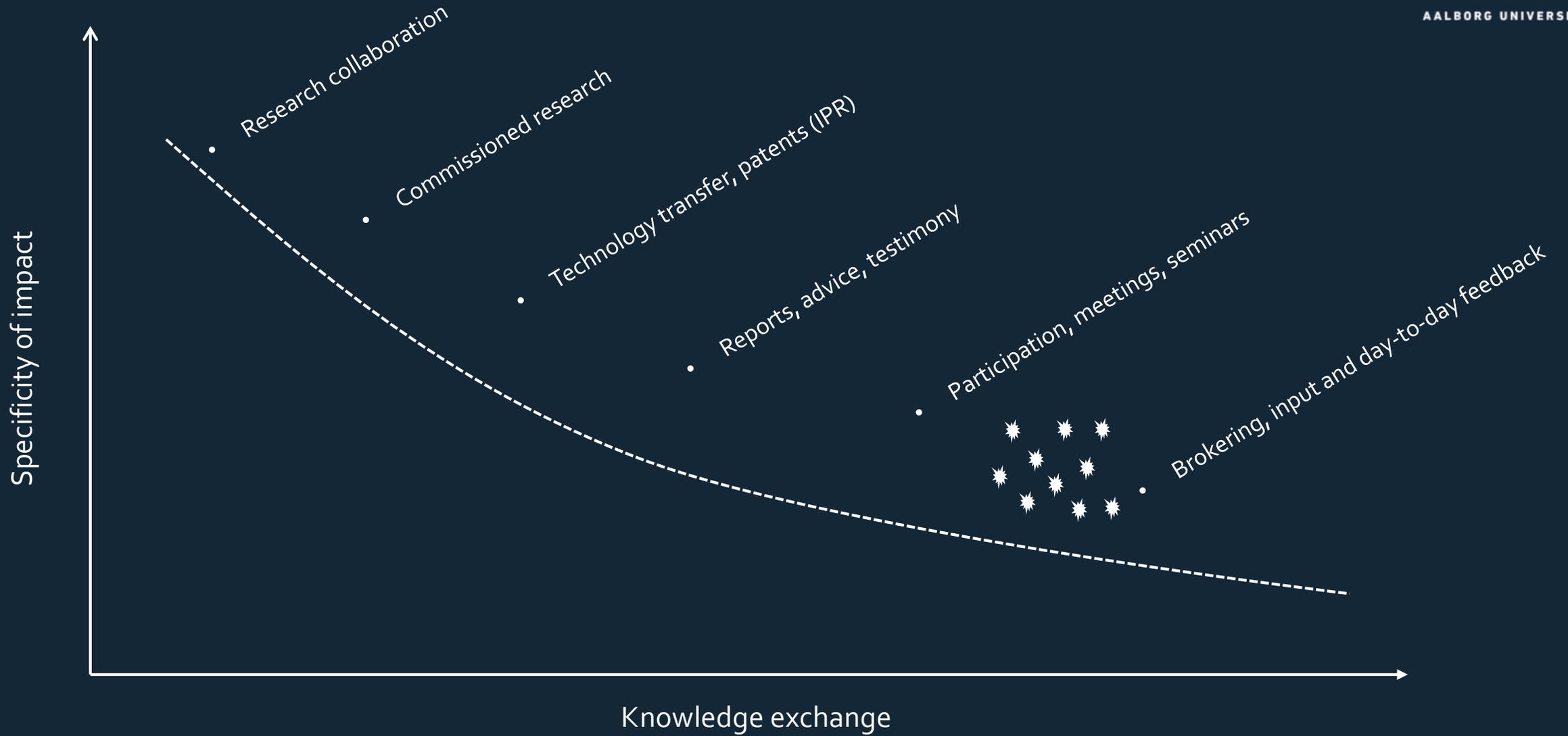
How to plan for impact

1. Know your audience(s)
2. Identify your purpose(s) for communication
3. Select (multiple) strategies suited to your audience(s)
4. Allocate resources for communication
5. Provide evidence & context to understand evidence

AAU Interdisciplinary Leadership Course

Thank you for the attention

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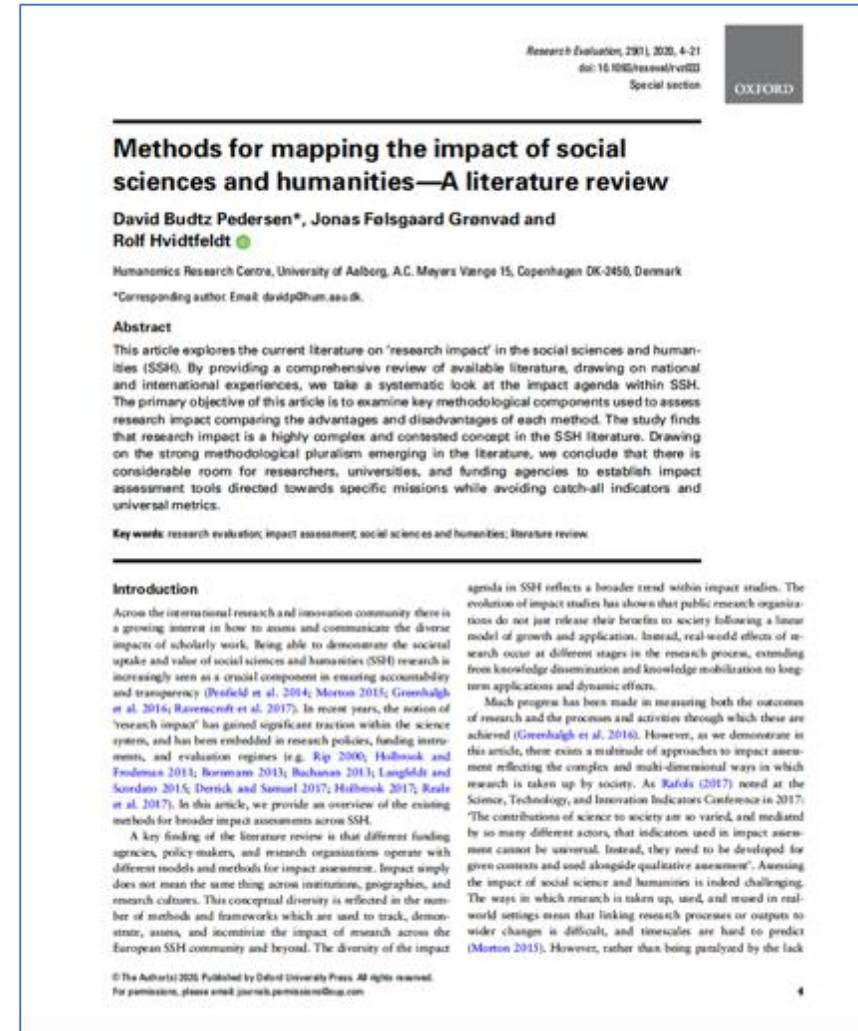
European Commission

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About the Institute on Governance

Founded in 1990, the Institute on Governance (IOG) is an independent, Canada-based, not-for-profit public interest institution located in Ottawa.

The IOG's mission is to promote better governance in the public interest.

The IOG's focus is on 21st-century public governance. Specifically, challenges to public sector institutions, including the public service, within a changing governance landscape.

The IOG offers leadership and learning opportunities, advisory services, and research.

Presentation Overview

- About the IOG
- The Social Contract for Science
- Skills – findings from Government Science and Innovation in the New Normal (GSINN)
- Culture and Communication – preliminary findings from Beyond Endless Frontiers: Rethinking the Social Contract for Science and Innovation

The PostWar Social Contract
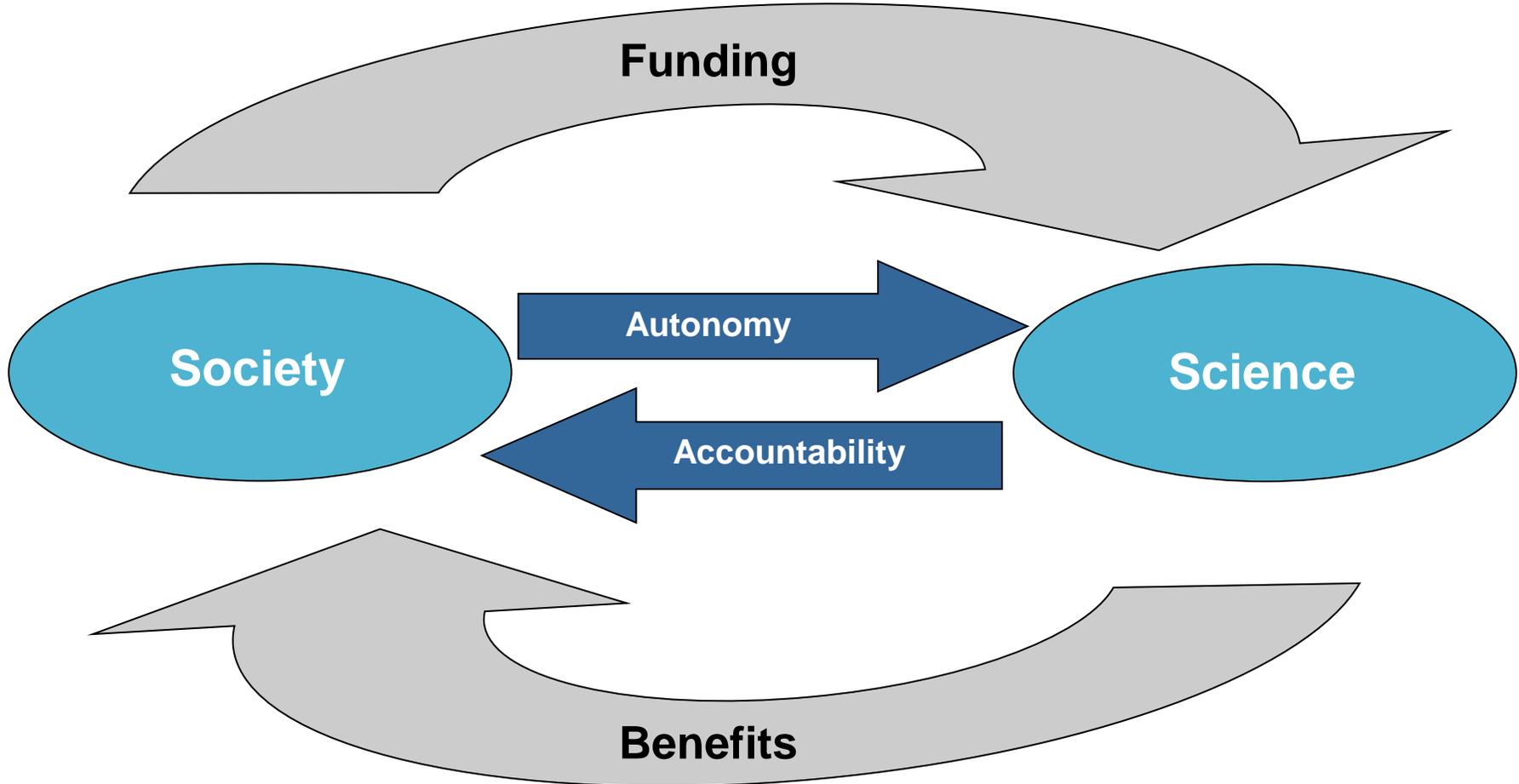
Regarding *Science: The Endless Frontier*:

"It's an easy read; eloquent, accessible, deserving of its notoriety. But it's also an artifact, and its continued influence is troubling. *STEF* does not speak to the diversity and complexity of science and technology policy today.

Let the seventy-fifth anniversary of *Science: The Endless Frontier* be the final celebration of a once-powerful idea whose time has now passed."

-- Daniel Sarewitz

Rationale for GSINN

The world in 2020…

- Public trust in government, in science and innovation was at risk, under strain

- A growing sense that the pandemic might fundamentally change all facets of government science and innovation

- GOC resources were focused on the immediate response; DMs expressed a need for medium-term planning support

- An appetite to understand the implications for more than just a single department; to examine horizontal issues across the enterprise

Project Governance

Eight federal departments: Agriculture and AgriFood, Health, Innovation Science Economic Development, National Research Council, Natural Resources, Public Health Agency, Public Services and Procurement, Transport

Steering committee (EX-level representatives from all partners) met periodically throughout the project and received regular briefings

Working group (EX-1 representatives from all partners) met regularly to support every stage of the research project

Pooled funding provided equal access / participation to all partners

Project Design

IOG's Science & Innovation area of practice co-designed this two-year research project with representatives from eight departments and agencies to:

- Hindsight exercise

- Literature reviews

- 8 Facilitated, foresight workshops with federal public servants

- 10 Facilitated, multi-sectoral roundtable discussions with federal government stakeholders

- 10 Peer-reviewed discussion papers

9 Project Themes

= Elements of a new governance framework for science, innovation and society in Canada

- **Equity, Diversity and Inclusion** looks at efforts to build a more diverse, equitable and inclusive public service science cohort

- **Global Research Collaboration and Infrastructure** examines collaboration trends and impacts, including Labs Canada

- **Inclusive Innovation** looks at an emerging approach to reconceptualize innovation in ways that leave no one behind

- **Indigenous and Other Ways of Knowing** explores knowledge co-production and research as a means to self-determination

- **Interdisciplinary Collaboration** discusses trend towards inter-, multi- and trans-disciplinary science to better address complex problems facing society

9 Project Themes

= Elements of a new governance framework for science, innovation and society in Canada

- **Mission-driven Research and Innovation** debates the need for challenge-oriented research programming in addition to non-directed research

- **Science Communications, Outreach, and Public Engagement** unpacks movements (e.g., citizen science) towards more open and collaborative ways of doing and communicating science

- **Skills and Knowledge** unpacks the changing demands placed on scientists in the public service, including against an outdated SE-RES framework

- **Trust, Integrity, and Science Ethics** explores the crisis of trust and integrity of science during the pandemic

Findings – Skills and Knowledge

The postwar contract committed that society would benefit from scientific pursuits without consideration for the relationship between science and society, nor the ability of scientists to communicate their findings.

The post-war contract did not conceive that scientists would not represent society, nor did they consider the need to be inclusive of other knowledge systems.

*Science needs to innovation not just for society, but **with** society.*

Sheila Jasanoff

Findings

About the scientific community

- The **skills and knowledge** expectations of scientists – to support policy and programs, to provide advice, and to perform science – are growing and changing. New demands placed upon scientists demand **workplace training** (especially social and emotional skills), mentorship, an incentive system to encourage a culture of learning inside the federal government, and a consistent approach to the provision of science advice across all departments.

Findings – Skills and Knowledge

New types of scientists emerge

- **Knowledge generators** in the lab/field who create new knowledge

- **Knowledge synthesizers** who aggregate (inter-, multi-, transdisciplinary) findings to determine their significance

  - Data scientists as an emerging area of practice

- **Knowledge brokers** who translate scientific findings for the benefit of policy, decision-makers, and stakeholders

- **Policy evaluators** who use science to review program outputs and results; typically RSA functions

Findings – Skills and Knowledge

Findings

Members of the scientific community have an ethical responsibility to make themselves – and their findings – understood by all audiences in order for society to benefit from science.

- Map social and emotional skills against government priorities

- Create incentives for scientists to acquire new skills

- Support a variety of learning styles

- Encourage mentorship

Findings – Skills and Knowledge

Findings
- Greater transparency of science in media
    - Bring back technical briefings

    - List technical experts on news releases

    - Empower knowledge synthesizers and knowledge brokers to proactively communicate scientific findings and to hold media platforms accountable for inaccurate information

Beyond Endless Frontiers
Rethinking the Social Contract for Science and Innovation

Rationale: to build on GSINN, but explore other sectors where science is at work

Governance: 6 themes (each with a lead, RA, and external advisors), External Advisory Council for project, all led by 3 co-directors: Jeff Kinder (CCA/UO), Rhonda Moore (IOG), Sandra Schillo (UO)

Project design
- Literature reviews
- Multisectoral stakeholder workshops
- Intersectional analysis
- Foresight workshops
- …

Science Communication Outreach and Public Engagement (SCOPE)
Preliminary findings

- High levels of engagement reported; variable and contradictory results by gender, age, professional status
- Discipline alters engagement: biology, ecology, geosciences & SSH more likely to engage than physics, chem, math
- Mixed view of primary audience (other scientists or "general public")
- Default to one-way communication
- Perceive colleagues have negative views about communication and engagement (and so do not promote activities internally)
- Many are actively discouraged by colleagues and administration from communicating with "the public"

Science Communication Outreach and Public Engagement (SCOPE)
Preliminary findings

Engagement goals include:
- Inspiring, motivating, informing the public
- Teaching critical thinking

Reasons for participating:
- Duty/ responsibility
- Enjoyment
- Belief efforts are making a difference
- Benefits to career

Reasons for not participating
- Lack of time
- Lack of recognition of the value by institutions

SCOPE
Preliminary observations

- Academics are investing time in public engagement in spite of their reward systems, most notably in the social sciences, biology, ecology and geosciences
- The conversation around effective and meaningful engagement is immature
- Without proper training and incentives, many academics default to employing the knowledge deficit model of engagement and exclusively use one-way communication vehicles, which are less/ineffective.
- There is demand for science communication training and practices
- How do we bridge different epistemological differences to create valuable public engagement?

Thank you

Rhonda Moore

Executive Director, Science

and Innovation

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Figure 1. Mapping trends that impact science against demand for social and emotional skills

Trends that impact science	The social and emotional skills they require
Digitization and digitalization	Collaboration: empathy, trust, cooperation
Interdisciplinary/Multidisciplinary/ Transdisciplinary research	Compound skills: critical thinking, met-cognition, self-efficacy
Open science	Emotional regulation: stress resistance, optimism, emotional control
EDI in STEM	
Citizen science	Engaging with others: sociability, assertiveness, energy
Braiding Indigenous Knowledge and Science	Open-mindedness: curiosity, tolerance, creativity
Mis/disinformation and fake news	
Science communication and public outreach	Task Performance: achievement motivation, responsibility, self-control, persistence
Science advice for policy	

Source: IOG roundtables, 2021 adapted to OECD, undated

Skills for Inclusive and Collaborative Innovation

AESIS. Societal Impact of Science

Halifax 19 June 2023

the la **COLLAB⚙RATIVE**

Beyond Endless Frontier is funded through a
SSHRC-PDG grant led by:

Institute on Governance   ISSP   TELFER

What science and innovation policy do we need to ensure that Canada builds and rewards the skillsets and knowledge scientists who work at the interface of science and society need to support inclusive innovation?

Sources

Scoping Review: Knowledge use at the science-policy interface

Narrative Review: Skill development and articulation

Scoping Review: Community-focused knowledge mobilization in SSHA

Rapid Review: Needs Around Capacity for Social Innovation in Nonprofits

Themes for the Analysis

Processes

Barriers

Drivers
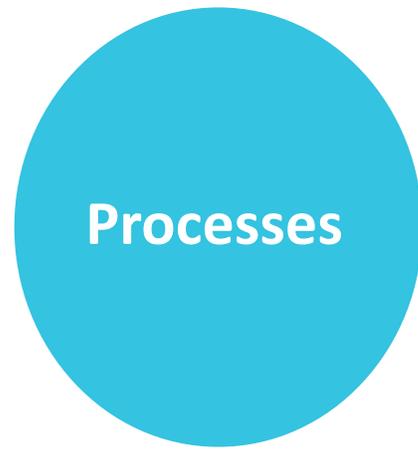
Skills

Skills Talk

Soft Skills are Hard: Higher Education should Focus on Foundational Skills   (Lapointe 2021: Lapointe & Propst forthcoming)

Taxonomies are entropically variable.

But stakeholders have shared implicit theories of foundational skills.

Foundational skills cluster around two types of organisational behaviours:

- adaptability/innovation
- social and emotional intelligence

Foundational Skills. Taxonomy

Scan to access the
Handout: Taxonomy of
Foundational Skills.

Or go to: http://bit.ly/3N5Qw3V

Skills for the Science-Society Interface

Skills needs at the science-society interface are not domain-specific. But their application revolves around activities that vary across different zones of innovation or impact:

- **Policy**: evidence-support for policy makers

- **Social Sector**: practitioner support in education and health; community-engagement, participatory approaches to research and "social innovation".

- **Economy**: "technology transfer", commercialisation or connected activities (e.g. patenting, licensing)

Zones of Innovation or Impact

Typical zones of impact/innovation	Main Types of knowledge being used	Typical knowledge users (organizations)
Policy	Social, human, scientific, community-based	Provincial, federal, municipal governments, think tanks, civil society
Social Sector	Social and Human, including social, ethical, cultural, legal, health, community-based	Social services, education, health
Economy	Technological, including engineering, medical, management, community-based	Industry, business, health

Barriers

Low Organizational Capacity

- Lack of time
- Lack of resources
- Lack of skills or analytical capacity on the part of individuals (

Lack of Connectivity

- Lack of connectivity between knowledge producers and decision makers

- Lack of connectivity amongst researchers needed for interdisciplinary research

- Lack of connectivity between different organizations working at the science-society interfaces

Drivers

Connectivity

- Trust
- Networks
- Effective Collaborative Practices
- Stakeholder engagement
- Intermediaries
- Diversity, inclusion, equity and accessibility

Skills for Inclusive and Collaborative Innovation

The skills needed to support connectivity at any of the interfaces between science and society need to revolve around inclusive and collaborative innovation.

- Increased capacity to use knowledge and/or innovate.

- Increased capacity to collaborate and foster inclusive teams and/or organizational cultures.

SSHA's awareness of the importance of the latter is unclear.

Skills for Inclusive and Collaborative Innovation

The capacity to use knowledge and/or innovate requires high levels of ability for problem-solving, deliberation, reflection and creativity.

The capacity to collaborate and foster inclusive teams and/or organizational cultures requires high levels of intercultural competence, integrity, communication and teamwork. From a holistic standpoint, integrity and self-management support collaborative innovation.

Skills for Inclusive and Collaborative Innovation

Skills for

- Delibe...
- Proble...
- Creativity

Skills for Collaboration

Cognitive toolkits, strategic leadershie.g. agile governance, p approaches

Managerial cultures and organizational infrastructures.

Catalysts:

- Self-Management,
- Growth Mindset

Arising Questions

Who should be responsible for ensuring scientists develop the skills needed to bolster knowledge use and innovation?

What role is the role of research granting agencies?

How might doctoral education change to increase knowledge use and innovation without disrupting the research ecosystem that requires high levels of specialisation?

How might industry/ community contribute to HQP training?

Recommendation

"There can be no impact assessment without skills and capacity: organisational cultures have to change to become more conducive for knowledge brokering – at the individual and collective level – driven by funders, universitites, intermediaries, and scientists."

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