Innovation by Design

McMaster Roundtables, 9 February 2024

REPORT

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Lead: Sandra Lapointe, Professor and Director of The/La Collaborative, Social Innovation Ideas and Action Lab

McMaster Team: Akacia Propst, Marie Hélène B.-Hardy

Advisory: Steve Hranilovic, Martin Horn, Melanie Heath

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Background Research

Under the theme "Innovation by Design", four roundtables were organised at McMaster between January 23rd and 26th, 2024. They engaged a total of 27 students in 90 minutes semi-structured discussions on the role of the social sciences, humanities, and arts (SSHA) in stimulating and advancing innovation in Canada. Each roundtable discussion was framed around a different question:

1. How do social sciences, humanities and arts (SSHA) contribute to technological innovation and its economic impact?
2. How do social sciences, humanities and arts (SSHA) contribute to policy innovation?
3. How do social sciences, humanities and arts (SSHA) contribute to innovation for impact in the social sector?
4. How do social sciences, humanities and arts (SSHA) contribute to social innovation and systems transformation?

The rationale for this approach comes from evidence drawn from the literature on knowledge use and innovation.[1] Processes of "knowledge use" and "innovation" that draw on university-based research are multifaceted and diverse. Innovation in all of its forms thrives on collaborations that take place at the interface between higher education institutions (HEI) and a range of "real world" actors whose needs and interests differ based upon their purpose. These actors include government, social sector organisations, public institutions (i.e., hospitals), local communities, and more. Knowledge use and innovation are rooted in practices designed to suit the specific needs of innovation partners. In this sense, processes of knowledge use and innovation vary across a range of broad, interconnected and overlapping zones of impact/innovation.

[1] See Lapointe, Sandra & Propst, Akacia (2023) Skills for Inclusive and Collaborative Innovation. Literature Review and Discussion Paper. http://hdl.handle.net/11375/29001

ZONES OF INNOVATION / IMPACT	
Technological Innovation	Higher education institutions (HEI), governments, and industry cooperate to create technology-driven economic growth. Research generates new ideas, and innovation is typically the result of "commercialization", "technology transfer", and similar activities that benefit from the support of industry liaisons and technology transfer offices who act as intermediaries to push out research and pull in investment partners.
Policy Innovation	Knowledge and expertise needed for policy making may extend to any aspect of HEI-based research and is increasingly expected to consider lived experience and stakeholder input. The co-creation processes through which knowledge is intentionally mobilized for policy making often takes the form of "evidence-support" deliberation and "knowledge exchange".
Social Sector Innovation	The social sector includes all organisations whose purpose is defined in connection to societal well-being. Knowledge mobilisation in the social sector generally aims at supporting practitioners (e.g. medical practitioners, educators, social workers) by ensuring that they have access to the most recent research in the relevant fields: social, ethical, cultural, legal, educational, and medical. Partnerships between HEIs and social sector organisations also revolved around other types of "community-engagement" activities.
Social Transformation	Social transformation is an intentional process through which systemic change is effected to address emerging social crises, wicked issues, and global challenges. Social transformation happens as a result of coordinating the actions of multiple stakeholders (industry, society, economy and policy) toward a collective goal. For this reason, social transformation revolves around processes that involve the co-design and co-creation of solutions such as those applied in community-based innovation, design, or living "labs".

Roundtable Consultations

General Remarks

In advance of the consultations, participants received a "brief" summarising the background research ahead of their roundtables (See Annexe). Participants were invited to define innovation as **the development and implementation of new products, services, strategies, and solutions that add value to society, whether their impact is economic, social, environmental and/or technological**. Each roundtable focused on the unique characteristics and challenges of a zone of innovation.

Participants were asked a series of questions that were structured to tease out perceptions on different sub-themes that correspond to the sections below. In addition, participants were also asked to comment on a scenario designed to apply understanding of the role of SSHA in a specific context.

A total of 27 participants from the Faculties of Humanities, Social Sciences, Sciences, Engineering, Health and Business participated in the 4 roundtables. More than half of the participants were from non-SSHA backgrounds (14/24). Participants self-selected the roundtable to which they wanted to participate, and the different themes attracted different proportions of SSHA and non-SSHA participants.

1. **Technological Innovation:** Predominantly participants from Sciences and Engineering backgrounds (5/6 participants).
2. **Policy Innovation:** Predominantly participants from SSHA backgrounds (7/8: 1 unknown).
3. **Innovation in the Social Sector:** Predominantly participants from Business faculties (3/6).
4. **Social Innovation and System Transformation:** Wide distribution of participants (1 Engineering, 2 Social Sciences, 2 Health Sciences, 1 Business).

Participants were polled at the beginning of the discussion to gauge their past experience with interdisciplinary and innovation-oriented research:

- 40% (10/25) of the participants who answered had worked on interdisciplinary projects involving SSHA, and their proportion was significantly higher in roundtables 2 and 4.
- 46% (11/24) reported having been involved in projects around innovation.

- Out of these 11 participants, only 3 reported that SSHA disciplines had been involved in their innovation projects.

With the exception of the discussion that revolved around policy innovation (oundtable 2), participants tended to describe innovation predominantly in terms of physical products and/or service and program delivery. The notion that innovation is needed in the social sector or to address systemic issue was not explicitly discussed. However, participants did mention that systemic changes is needed (e.g., in universities' degree structure and funding systems) to increase their capacity to contribute to social innovation. To the extent that they saw value in all SSHA disciplines, participants did not report thinking that any SSHA discipline was most important in any context, but psychology, sociology, anthropology, and economics were the disciplines most often mentioned in discussions. Participants broadly agreed that while interdisciplinary collaboration with and within SSHA disciplines is important, it is not currently happening.

Comparing SSHA and non-SSHA attitudes

Overall, participants perceptions of SSHA's contribution to innovation tended to vary depending on their background, i.e. whether they were trained in SSHA or non-SSHA disciplines. Participants from non-SSHA backgrounds reported having little contact with SSHA disciplines and/or being generally unaware of what SSHA work and research involves. Multiple non-SSHA participants reported that they had not previously reflected on the role of SSHA in innovation. Non-SSHA participants were generally uncertain about SSHA's potential to contribute or the role they might play in innovation.

Participants from non-SSHA programs understood the paradigm of innovation to revolve around the design and implementation of new products (hardware), and saw SSHA as being most valuable in the periphery of innovation activities, i.e. marketing research, translating research for users (e.g. storytelling), understanding the attitudes and behaviours of communities for which products/services are being designed for, and to assess risk associated with the ethical dimensions of innovation. Non-SSHA participants saw the need for SSHA research/expertise to occur before and/or after research, not as part of the research that drives innovation. Non-SSHA participants suggested that while SSHA-training increases the ability to do these things well, people without SSHA training can also take up these tasks. The perception was that the value of SSHA expertise is unclear, and that while useful it is not necessary to innovation work.

By contrast, participants from SSHA disciplines perceived SSHA expertise as relevant throughout the innovation process, they understood innovation to have a broad scope, using the term in connection to policy and/or systems transformation, not just product innovation. SSHA participants described SSHA as producing value in innovation processes by increasing capacity when it comes to identifying what problems need to be addressed, understanding systems, and having the ability to engage with communities throughout the research process. SSHA participants also stressed the value of SSHA in fostering inclusivity and facilitating the inclusion of diverse world views as part of the innovation process.

How SSHA contribute to innovation

Participants' views on SSHA's contribution to innovation fall under six broad categories: Enhanced Methods, Increased Connectivity, Better Research Design, Enhanced Knowledge Mobilisation, Rethinking Paradigms, and Enhanced Ethical, Social and Cultural (ESC) awareness and EDI. We summarise the evidence collected below.

Theme	Responses
Technological Innovation	
Enhanced Methods	SSHA cultural and social expertise helps with data interpretation.
	SSHA provide different disciplinary perspectives in innovation research (i.e., promote the value of different ways of doing and different method).
Enhanced ESC-awareness and EDI	SSHA contribute an understanding of human behaviour to inform how specific products are actually used by people, to inform public health policy, and to understand the context around "compliance" in healthcare contexts (e.g., patient centred health care).
	SSHA can increase efficiency of marketing by providing depth of information on target populations.

Roundtable 2: Policy Innovation	
Enhanced Methods	SSHA knowledge is useful in qualitative analyses, e.g. of populations' and individuals' lived experience.
Better Research Design	SSHA knowledge is useful for the purpose of determining whether an idea is actually feasible (i.e., will people adopt the innovation) and how ideas can be scaled up.
	SSHA knowledge is useful for the purpose of identifying policy stakeholders.
	SSHA knowledge informs the frameworks and justification behind policies.
Enhanced Knowledge Mobilisation	SSHA produce evidence used in policy innovation.
	SSHA expertise can be useful for the purpose of effective storytelling and research communication.
Enhanced ESC-awareness and EDI	SSHA can be useful to understand human interactions and human behaviours that can inform policy design and implementation.
	SSHA knowledge is needed to identify where policy innovation is needed.
	SSHA expertise is useful to elucidate the cultural context in which policy needs of different groups arise.
Roundtable 3: Innovation in the Social Sector	
Increased Connectivity	SSHA helps identify appropriate stakeholders.
Enhanced Knowledge Mobilisation	SSHA knowledge is useful for the purpose of educating stakeholders about innovation, but less so when it comes to creating products.
	SSHA expertise can be useful for the purpose of effective storytelling and research communication.
Enhanced ESC-awareness and EDI	SSHA expertise is needed to understand human behaviour, social structure, and cultural dynamics (e.g., patient centric health care).
	SSHA expertise is needed to measure social impact and, in the context of environmental impact studies, to determine feasibility of a project.

Roundtable 4: Social Transformation	
Increased Connectivity	SSHA expertise helps facilitate and build connections between universities and communities.
	SSHA expertise is needed to build bridges between generations and connect people (e.g., working with disadvantaged and minoritized communities, understanding differences in privilege).
Better Research Design	SSHA knowledge increases capacity to identify the ethical implications around innovation projects.
Enhanced Knowledge mobilisation	SSHA expertise can help incorporate technology and social media into systems change to make programs more accessible.
	SSHA help identify issues to be addressed and where innovation is needed.
	SSHA supports policy making
	SSHA expertise is needed to transfer knowledge and educate people on what services are available to them.
Enhanced ESC-awareness and EDI	SSHA are needed to understand social determinants of health and behaviour.
	SSHA are needed to understand cultures.
	SSHA provides historical perspectives that help us understand the root of the issues we face today.
Rethinking Paradigms	SSHA question status quo ideologies and practices.

A Note on the Arts

The Roundtable discussions were heavily skewed towards the role and import of social sciences and humanities. Arts disciplines were not considered or discussed by participants unless specifically prompted to do so. This could give the impression that, overall, arts are not widely thought of as part of the innovation landscape in Canada. However, when

asked specifically about arts (as a follow up question) participants mentioned a number of ways in which arts are relevant to innovation:

- Arts can generate discussion around innovation topics.
- Arts provide shared and neutral spaces outside of academic institutions for open discussions with diverse groups with viewpoints.
- Arts could be useful for the purpose of democratising research around innovation.
- Arts can help humanise complex issues .
- The creation, sharing, and discussions of art as part of innovation projects can promote relationship building through artistic processes that emphasise commonality.
- Storytelling through diverse and less restricted mediums (i.e., not solely written communication).

Thought Experiment

We anticipated that participants would often give generic, high level answers that reflect difficulties with anchoring their perceptions around SSHA's contribution to innovation in everyday practice, or to the experiences they have of their own field in terms of practices and disciplinary cultures. To deepen our understanding of participants' perceptions, we invited them to ponder the following scenario:

"There is a new grant program for innovation that requires SSHA researchers to be involved in all aspects of research, design, and implementation. What would ideally be the role of the SSHA research? What would be the best way to make sure that SSHA knowledge is fully integrated?"

The thought experiment led participants to contemplate the role of SSHA in providing ethical guidance and social and cultural insight, its capacity to support impact assessment, and to generate data on end-users and other stakeholders. Participants suggested that the best way to integrate SSHA into innovation processes is to institutionalize interdisciplinary collaborative practices, provide clear guidelines and frameworks for interdisciplinary collaborations, and improve communication across disciplines. When asked if SSHA currently participated to innovation in the ways they described, participants' answer was a resounding "No".

Here are some of the more specific claims participants made about ways to support a better integration of SSHA:

- When creating a new therapy for PTSD, SSHA can bring economic and business expertise to ensure that the product is affordable and accessible. SSHA can contribute to our understanding of cultural differences between target groups (i.e., civilians versus military) and differences in how they perceive and use the product. (Science participant)
- When working to develop a new technology, SSHA can help illuminate ethical concerns and the impact that reduced privacy can have. (Engineering)
- We should broaden the ethics approval process to include not only ethical considerations but social and cultural considerations and integrate SSHA expertise in the process: ensuring that technological innovation is properly shepherded. (Engineering participant)
- MIT is renowned for technological innovation. At MIT, the sociology department collaborates with other departments to provide SSHA expertise on innovation projects. (Science participant)
- When creating policy, we can bring in interdisciplinary teams to evaluate a proposal from different disciplinary perspectives in order to evaluate and highlight where cultural values have been implicitly built into a policy and identify biases. (SSHA participant)
- When developing the prototype of a new technology, SSHA researchers should be involved in the design thinking process and work with end users to get their feedback. (Engineering participant)
- Companies currently recruit philosophy graduates because of their capacity for abstract thinking and analytical skills. They can aid with weighing advantages and disadvantages of decisions and bring an alternative perspective. (SSHA participant)
- Guidelines should be created for university researchers and students on how to interdisciplinary research and best practices for communicating across disciplines. (Health Science participant)
- Research in environmental studies have committees that collaborate with SSHA and health science researchers to create reports on the social impacts of, e.g. a proposed building or project will have. (Business participant)
- We should create guidelines with terms and definitions across disciplines to aid with cross-disciplinary communication. (SSHA participant)

Barriers to SSHA involvement in innovation

Participants' discussion of barriers tended to converge. Non-SSHA participants (Science, Health, Engineering, and Business) saw the main barriers to SSHA's ability to contribute to innovation as residing in a poor understanding of SSHA disciplines' purpose and research, and a resulting difficulty with articulating their value. SSHA participants, on the other hand, saw institutional structures, lack of recognition, and negative perceptions to be amongst the main barriers. In addition, participants pointed to the following:

- Because the value of SSHA expertise and of what SSHA can do is not well understood, collaboration with SSHA research may be perceived as a potential waste of investment (i.e., have less money for STEM people if you hire a SSHA person).

- Disciplinary silos in academic institutions impact the capacity to appreciate the value of SSHA in innovation:
    - University education doesn't equip students to collaborate across disciplines or provide many opportunities to do so.
    - STEM education is mute on the importance of SSHA research and does not expose students to SSHA content.

- Innovation for social impact and social transformation are perceived to be riskier than product and process because impact is not easily measurable.

- It is difficult to measure the impact of SSHA in innovation projects and thus difficult to justify the cost of integrating team-members that stem from SSHA.

- The stereotypes in STEM that SSHA is easier and not as rigorous persist.

- Qualitative data is not valued as much or seen to be as useful or rigorous as quantitative data.

- Disciplinary jargon makes interdisciplinary work difficult because researchers don't understand each other.

- Change is difficult.

- The institutional culture of academia is a barrier:
    - Researchers' protectionism over their area of research and their status in their field can dissuade them from doing interdisciplinary research and potentially cede their status.
    - Academics do not publish research in formats or through avenues easily accessible to non-academics.
    - The 'publish or perish' culture makes it difficult to do community engaged research and collaborate with or learn from other disciplines.

- More funding is always needed:
    - Funding for innovation is skewed towards technological innovation.
    - There are many exclusions in the granting systems (e.g., international scholars are barred from applying for many grants).

- There is a lack of institutionalised networks and effective communication channels between academic institutions, and between academic institutions and communities.

- Stakeholders are not sufficiently integrated into the innovation process.

- Structural and institutional barriers limit our institutions' capacity to create and utilise talent for innovation, and the ability of individuals to experiment with and participate in innovation:
    - Access to higher education is limited (i.e., cost of tuition fees).
    - Administrative structures make interdisciplinary research difficult:
        - degrees requirements restrict the types of courses students can take during their university education.
        - Graduation timelines limit capacity to explore other disciplines and build interdisciplinary collaborations.
    - Academic institutions tend to lack diversity.
        - This stems from a lack of accessibility and lack of support for alternative learning and knowledge systems.

- Capitalistic western cultures put a premium on money as a measure of success, which doesn't promote innovative research/practices.

- In the policy innovation space, the focus is overwhelmingly on economics and SSHA involvement is thus dominated by economists.

Drivers of SSHA involvement in innovation

In addition to tackling the barriers the group had identified, non-SSHA participants often discussed drivers in terms of making SSHA research and value more visible to non-SSHA researchers. Participants from all disciplines formulated several suggestions toward a full integration of SSHA to innovation:

- Articulate and communicate the value of SSHA and the impact of SSHA projects. For instance:
    - Demonstrate how SSHA can bring/create monetary value to universities.
    - Demonstrate value of qualitative data.

- Address systemic issues (e.g. better paying students and researchers) to enhance overall capacity and to support inclusivity and diversity in innovation. Current conditions are not conducive to experimentation and iteration which are at the heart of design.

- Define the role of qualitative analysis of various dimensions of human and social experiences as “evidence” and “research”, which are in the purview of SSHA discipline.

- Find new ways to leverage SSHA skills in public service.

- Increase connectivity (e.g. networks, collaboration) by supporting the building of closer relationships between researchers and non-academic stakeholders (e.g. around policy making).

- Institutionalize interdisciplinary work in universities by creating more interdisciplinary departments and courses:
    - Create more shared spaces within the university for students and researchers to get together and discuss their work.
    - Centre more work around answering a specific question rather than around a discipline.
    - Create interdisciplinary departments that are centred around creating impact rather than a specific discipline.

    - Create courses on examining societal problems through different disciplinary lenses (i.e., more interdisciplinary, co-taught courses).

- Promote values of interdisciplinarity, collaboration, and importance of SSHA research early on (e.g., start in high school if possible).
    - Recognize and reward SSHA researchers' contributions better.

- Create tools to measure qualitative SSHA impact.

- Better funding for non-technological innovation that includes SSHA disciplines.

Final Remarks

The data gathered through the roundtable discussion held at McMaster University is helpful for the purpose of identifying assumptions graduate students make about the role of SSHA in all zones of innovation, which presumably reflect widespread attitudes in academia.

It would be important to determine how to address the barriers to the integration and the realisation of SSHA's potential in all aspect of innovation.

More importantly it is crucial to determine what is most likely to drive the integration of SSHA to innovation processes, given the assumptions stakeholders make about their role.

Future efforts should focus on determining whether the assumptions academic (and other) stakeholders make about SSHA's role in innovation do justice to what their role can and should be. If there is a gap between what stakeholders believe SSHA can contribute to innovation, and what SSHA effectively contribute in light of successful collaborations toward innovation in technology, policy, the social sector and in social transformation, there is a need to provide better exemplars to educate stakeholders all around.