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Societal interaction plans—A tool for enhancing societal engagement of strategic research in Finland

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Abstract

In this paper we investigate the practices and capacities that define successful societal interaction of research groups with stakeholders in mutually beneficial processes. We studied the Finnish Strategic Research Council's (SRC) first funded projects through a dynamic governance lens. The aim of the paper is to explore how the societal interaction was designed and commenced at the onset of the projects in order to understand the logic through which the consortia expected broad impacts to occur. The Finnish SRC introduced a societal interaction plan (SIP) approach, which requires research consortia to consider societal interaction alongside research activities in a way that exceeds conventional research plans. Hence, the first SRC projects' SIPs and the implemented activities and working logics discussed in the interviews provide a window into exploring how active societal interaction reflects the call for dynamic, sustainable practices and new capabilities to better link research to societal development. We found that the capacities of dynamic governance were implemented by integrating societal interaction into research, in particular through a 'drizzling' approach. In these emerging practices SIP designs function as platforms for the formation of communities of experts, rather than traditional project management models or mere communication tools. The research groups utilized the benefits of pooling academic knowledge and skills with other types of expertise for mutual gain. They embraced the limits of expertise and reached out to societal partners to truly broker knowledge, and exchange and develop capacities and perspectives to solve grand societal challenges.

Keywords: societal interaction; strategic research; dynamic governance; capacity building; co-production of knowledge; knowledge networks.

Introduction

The Grand Challenges of humankind have stressed the need for and status of research. Sudden global crises, such as environmental disasters and pandemics, exacerbate the urgent need for verifiable research knowledge and applications. Such situations also challenge the process and governance of research, and its ability to implement new procedures that engage all relevant stakeholders in ways that increase societal impact.

The Responsible Research and Innovation (RRI) framework was proposed to guide research processes in this direction. The rise of new funding instruments with a specific focus on societal interaction between researchers and other stakeholders reflects a Europe-wide evolution of science-society relations. Today's researchers function in a rapidly changing environment and operate between multiple pressures, with norms and expectations arising from innovation policy changes in European and national contexts (Stilgoe, Owen and Macnaghten 2013).

Flink and Kaldeewey (2018) have acknowledged an ongoing 'pluralization of STI policy discourses', in which earlier distinctions, particularly the one between basic vs. applied research, have been replaced by a plethora of research policy concepts such as "grand challenges", "frontiers" and "Responsible Research and Innovation" (RRI). The challenge-oriented discourse featured under the societal challenges pillar of the European Union's (EU) Horizon 2020 framework programme (EC 2020) and continues in the Horizon Europe framework programme. Researchers have responded to the call to develop societally-oriented practices by developing new ways to collaborate across disciplines,

sectors and professions in an open search for solutions to support transformation in society (Mazzucato 2018).

Linked with this emphasis on societal challenges is the increasing focus on civil society as the "fourth helix" of the research ecosystem. While industry, academia, and government are core components of the Triple Helix (Etzkowit and Leydesdorff, 1998), civil society has received attention through the Quadruple Helix model, adding the fourth helix, the media-based civil society, which rather than being merely a beneficiary or recipient of research, now increasingly participates in knowledge production as co-creators (Carayannis and Campbell, 2009; Carayannis, Barth and Campbell 2012; Carayannis and Campbell, 2019). These strands are also included in the different variations of participatory methods and discourse types that Muhonen, Bennenworth and Olmos-Penuela (2019) identified in their impact pathways model.

Overall, while societal interaction and public engagement activities have gained prominence as the "third responsibility" of universities, it has become more important to evaluate the impacts of such activities. This includes the evaluation of research proposals that follow the RRI principles. Approaches for evaluating or appraising the impacts of PE have emerged in recent years (e.g. Aggett, Dunn and Vincent 2012; Borrow and Russo 2015; Wellcome Trust 2015). However, the field develops fast, and the borders of science and society have become fuzzy. Reflecting this complexity, Rask et al. (2018) developed the "Co-creation radar" (Rask and Ertiö, 2019; Rask et al. 2021) that compressed close to 300 criteria used in the evaluation of participatory processes to 12 metacriteria.

While the work to develop more established frameworks for evaluating the quality and impacts of societal interaction is still forming, case studies can provide valuable input in scoping the issues that are relevant for understanding societal expectations and imaginaries that guide this activity.

In this article our case is the societal interaction plan model of the Finnish Strategic Research Council (SRC), which functions under the Academy of Finland. This funding instrument reflects the Europe-wide developments towards more inclusive research, and it was designed, in effect, to put the RRI policies and principles into practice. While there have been studies analysing the interaction approaches of researchers, we explore the issue from a new angle by focusing on the role of the interaction plan (SIP) in the construction of engagement-oriented research projects. Studying how the first consortia constructed and argued for the structure of their design during the planning and very early implementation phase provides a glimpse into the initial conditions of the SRC projects, including the role of ex ante, mid-term and ex post evaluations of their dual work. Thus, the focus of this study is not on the actual impact or co-production itself but on how the key actors perceived the ways in which societal impact could be created in their projects and how they, as forerunners, intended the knowledge co-production processes to function.

To this end, our goal in this paper is to address the following questions

- 1) *What types of practices for better societal interaction did the research consortia funded by the Finnish Strategic Research Council propose?*
- 2) *How did the societal interaction plans contribute to new capacities and practices of research at the commencement of the projects?*

This paper unpacks the dynamics and complexities related to capacities that lie behind the first funded cohort of the Finnish SRC. The SIPs and the implemented activities and working logics discussed in the interviews provide a window to explore how the required, active societal interaction reflects the call for dynamic, sustainable practices and development of new capabilities which better link research into societal development. This paper delves into how the thinking and working methods of innovative researchers formed in practice at the outset.

Timewise, the focus is on the first six months of project implementation, on how and with what sets of logic the plans were constructed and adjusted at the beginning. To explore how the in-built RRI dimensions of the SRC funding function in reality, we rely on a framework of dynamic governance (Neo and Chen 2007; Guldbrandsen 2014). It provides a framework for studying the societal interaction of researchers, and its links to research governance, including evaluation, systematically.

Conceptual framework

Developments regarding the meaning, form and evaluation of societal impact of research have become more varied. The discourse includes various types of participatory methods ranging from interactive dissemination, public consultation and advisory practices to the building of epistemic communities. Muhonen, Benneworth and Olmos-Peñuela (2019) identified four main categories of general impact pathways: dissemination, co-creation, reacting to societal change and driving societal change. Each of these includes more

specific pathways and mechanisms for reaching impact. While the first two are more communication or service oriented or use society as a laboratory of sorts, the latter two refer to more proactive goal-driven and societally oriented research. In these categories, researchers deliberately align themselves with societally topical themes, anticipate potential windows of opportunity and proactively seek to influence societal change. These approaches align with the ideas of the Finnish SRC and the SIP model while the first two are linked to more traditional ways of science communication and consultation.

However, for the purpose of understanding the broader dynamics and logics as well as needed capacities of the Finnish SRC-consortia, the impact pathways approach requires an additional element that includes the design planning phase. The role of ex-ante research evaluation in boosting societal impact of research has also been highlighted in recent discussions from the angles of the role and practices that are used to perform ex-ante research evaluation (Ma et al. 2020; Benneworth and Olmos-Peñuela 2022). Hence, the conceptual framework in this article meets the need for a model that can tap into the intricacies of the process and logics of societally interaction-oriented research from the time of planning to application, from the perspective of the research consortia. For this purpose, this article adopts the dynamic governance model as a conceptual framework. This model provides a holistic framework that includes the capacity-focused human resource perspective and design perspective of the planning phase, in addition to the actual interaction practices.

Dynamic governance in STI refers to reciprocal interactions between researchers and non-academic stakeholders such as industry, civil society organizations, government and citizens. It is the ability to handle issues in a rapidly-changing environment and to adjust policy formulation and action continuously in order to serve particular collective interests (Porter 2007). Through dynamic governance the creation and exchange of knowledge is multi-directional and open-ended. Interaction takes place as an exploratory, inductive process and sets performance standards for responsible research and innovation (Guldbrandsen 2014). A more co-creative, multi-directional approach also supports the pooling of (human) resources in a manner that allows different types of expertise to be used in problem solving (Howaldt et al. 2014). As such, it complements the impact pathways model (Muhonen, Benneworth and Olmos-Peñuela 2019) which addresses on the ex-post view of how impacts occur by examining the ex-ante side of the coin. This approach puts attention on how different types of partnerships and societal interaction are utilized alongside research activities. The dynamic governance model allows us to explore the logic of the interaction design alongside its early application, and how it considers the role of capacities as well as practices.

The focus of the dynamic governance framework is on adaptive policies and continual evaluation of action. These are ways to ensure that organizations and actors can anticipate future developments, to appraise and revise them critically, and to utilize expertise across boundaries. These three preconditions—thinking ahead, again and across—form the basis of an open and participatory environment that produce dynamically capable people and agile processes (Neo and Chen 2007). In other words, its starting point is participatory rather than viewing interaction as something externally oriented. However, combining expertise across boundaries

opens up potentials as well as tensions when participants bring forth differing viewpoints. While some capacities support dynamism, others inhibit it in the interaction between different types of actors (Gómez and Ballard 2013). To tap into pools of extended expertise (Rask 2009), the ability of people to reflect on their knowledge, its limits and its relation to others is essential. This means going beyond the networks that consist of similar types of actors or knowledge and requires a time perspective that includes planning instead of only execution.

Dynamic governance provides capacity-based criteria for exploring the elements of interaction: anticipation, reflexivity, trans-disciplinary resource mobilization and continuity (Neo and Chen 2007; Rask et al. 2018). Each of these is reflected through interaction practices aimed at serving the goals of projects, such as user-centric open innovation frameworks where public and private actors collaborate to meet jointly shared goals (e.g. living labs).

Anticipation refers to the ability to plan actions in a strategic manner for the home institution of an actor and partner the institutions. It refers to foresight capacities to prepare wisely for future developments. Reflexivity rests on the will and skill of actors to analyse issues from different points of view, and to allow their own perspectives to be challenged while challenging those of others (Neo and Chen 2007; Guldbrandsen 2014). Trans-disciplinarity reflects a scholarly approach that not only sees a phenomenon studied with the tools of several disciplines but goes further to mix these under a shared approach (Rask et al. 2018). As such, trans-disciplinarity encourages researchers to shake the foundations of their traditional disciplinary boundaries to grasp a complex phenomenon with a holistic approach (Strober 2010). It focuses on problems that cross disciplinary boundaries and cannot be solved with the tools of one discipline or through lighter multi-disciplinary actions (Neo and Chen 2007). Continuity refers to the need and ability of research projects to link actions to a longer chain of events, and to allow for evolution within a project. It also provides a necessary factor to balance rapid changes and to ensure longer term sustainability and applicability of actions (Stilgoe, Lock and Wilsdon 2014).

From a dynamic governance point of view, societal interaction constitutes a long-term, planned and structured learning process. It should support the solving of jointly defined problems in a manner that promotes learning by all participants through the use of continual feedback loops to evaluate actions with a developmental approach at different stages (Romme and Endenburg 2006). Attention is placed on the capacities of all participants and their ability to use them as catalysts in the development of context-wise practices. Using dynamic governance as a conceptual approach to explore interaction is a way to study the interaction governance of those who associate together in changing circumstances. Furthermore, it emphasizes the role of aims as guiding principles in the interaction, their relation to expected impacts and in-built negotiation of interests, as well as practices to serve these aims. It sheds light on the processes that support the resilience and sustainability of the solutions. Furthermore, it traces the initial planning phases of impact pathways which lie behind dominant mechanisms of interaction (Muhonen, Benneworth and Olmos-Peñuela 2019). This means tapping into background mechanisms through which societal impacts arise over time.

The critical point in applying a dynamic governance model is looking for the presence or absence of dynamics of

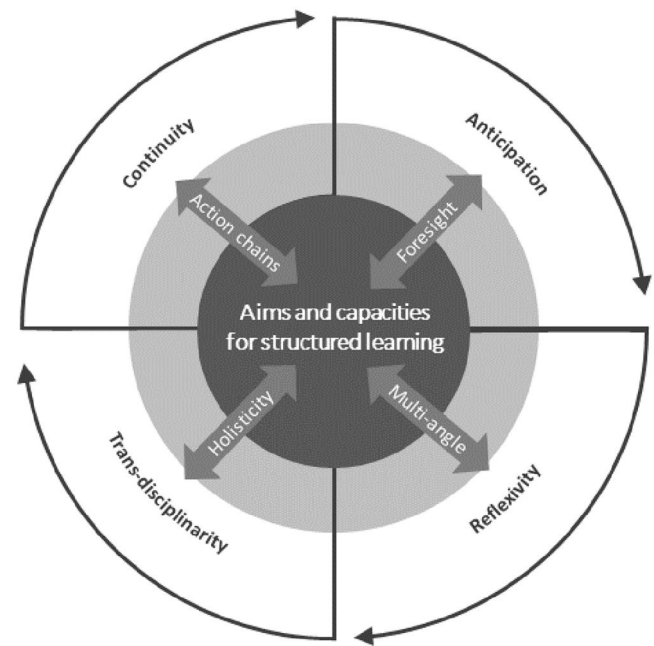


Figure 1. The constitutive parts for dynamic governance of societal interaction of research.

exchange, tension of changes and collaboration (Guldbrandsen 2014). In applying the model, our analysis of data follows the capacity-based elements of dynamic governance, ie. anticipation, reflexivity, trans-disciplinary resource mobilization and continuity. Each of these are reflected against interaction practices. The analysis combines the planning phase data (SIPs) with the early application phase (interviews). Before moving on to data, methodology and the results, we will provide a background context to the SRC.

Subject and setting

The strategic research funding

The Finnish SRC was founded in 2014 as part of a government decision-in-principle on the comprehensive reform of research institutes and funding. The SRC funds long-term, programme-based and multi-disciplinary research, which is oriented to finding solutions to grand societal challenges. The SRC aims to serve the renewal and development of Finnish society by joining multi-disciplinary research groups with experts working on the same challenges outside academia. It converges well with the mission-oriented thinking of the EU where research aimed at finding solutions to grand societal challenges is encouraged through specific funding (Mazzucato 2018).

The SRC introduced a new two-part ex-ante evaluation model for applications. One part looked at quality regarding the projects' societal relevance as described in societal interaction plans, while the other focused on research excellence. There was peer review of both parts by separate panels (Jokela and Vauhkonen 2019).

The SIPs were required to present the aims of interaction for the entire project. They were designed to guide the planning and implementation of the research process in ways that support the systematic participation of decision-makers, civil society and companies for the life of the project. The SIPs required a more comprehensive process to be included in the research process than in conventional communication and

Table 1. Required parts of the interaction plan (SIP) for the first call of the SRC

| Actors | Tools of interaction | Responsibilities and implementation | Schedule |
|---|--|--|---|
| What are the central actors from the point of view of the theme, programme and utilization of research results in the phases of the project? | What are the interaction practices and channels during the phases of the project? | How and by whom is interaction put into action? | How is interaction timed at the beginning and during research? |
| What are the knowledge needs of utilizers? How have these been mapped? How can these actors utilize the knowledge? How do they benefit from interaction with researchers? | How are interaction processes timed (e.g. in relation to drafting of a law or other projects)? | What previous references does the research group/consortium have from interaction? Interaction requirements should be considered when choosing partners. | How is the utilization of knowledge produced in the project secured during the funding period and beyond? |
| In which sectors and how does change occur? | How is collaboration with the media managed (including social media)? | | |

Table 2. Sixteen SRC projects and thematic programmes.

| Projects | Thematic programme | | |
|----------|--|--|---|
| | Climate-neutral and resource-scarce Finland (PIHI) | Equality in Society (EQUA) | Disruptive Technologies and Changing Institutions (TECH) |
| | Transition to a resource efficient and climate neutral electricity system (EL-TRAN) | Finnish Childcare Policies: In/Equality in Focus (CHILDCARE) | Cloud Computing as an Enabler of Large-Scale Variable Distributed Energy Solutions (BC-DC) |
| | SmartSEA—Gulf of Bothnia as Resource for Sustainable Growth | Social and Economic Sustainability of Future Working Life: Policies, Equalities and Intersectionalities in Finland (WeAll) | Digital Disruption of Industry (DDI) |
| | Sustainable, climate-neutral and resource-efficient forest-based bioeconomy (FORBIO) | Tackling Inequalities in Time of Austerity (TITA) | Platform Value Now: Value capturing in the fast-emerging platform-ecosystem (PVN) |
| | Novel protein sources for food security and climate (ScenoProt) | Preventing Social Exclusion: What Works and Why? (PSE) | Robots and the Future of Welfare Services (ROSE) |
| | | Work, Inequality and Public Policy (WIP) | Smart Energy Transition—Realising its potential for sustainable growth for Finland's second century (SET) |
| | | Arts as Public Service: Strategic Steps towards Equality (ArtsEqual) | |

dissemination plans. Details of the partners, intended actions, tools, distribution of tasks and timelines constituted distinct parts of the model (Table 1).

Competition for funds was fierce. The SRC received 130 applications, of which 13% were selected for funding. The selected projects excelled on both their research quality and societal relevance.

The SRC first call in 2015 had three themes, called 'programmes': Climate-neutral and resource-scarce Finland (PIHI), Equality in Society (EQUA) and Disruptive Technologies and Changing Institutions (TECH), each focusing on grand societal challenges (Table 2).

Data and methodology

The SIPs under study were initially analysed in connection to the EU FP7 funded PE2020 project carried out in 2014–17 (Aarreaara and Pulkkinen 2016). Out of the 16 funded projects, this article focuses on 13 which agreed to participate in the study.

The collection and analysis of data took place in phases. In the first phase an inductive content analysis of the SIPs was done to form an overall understanding of the starting point of each project and the planned interaction. The findings of this analysis formed the basis for the interview guide by helping identify the core issues and gaps in knowledge that interview data could highlight: how partnerships and plans were formed, what stumbling blocks existed, how good practices were identified and weaker links strengthened.

In the second phase, interviews were held with project representatives responsible for societal interaction, and/or the consortium leader ($n = 18$). The interviewees were selected based on their positions that allowed them to see the whole of the project, the interlinkages between work packages and how the interaction activities were built to connect with the research actions.

The requests for interviews were sent to both the consortium leaders, who were senior academic researchers, and the leaders for societal interaction, who were either academic

Table 3. Division and number of interviewees.

| Type of subject | Thematic programmes | | |
|------------------------|--|----------------------------|--|
| | Climate-neutral and resource-scarce Finland (PIHI) | Equality in Society (EQUA) | Disruptive Technologies and Changing Institutions (TECH) |
| No. studied projects | 4 | 4 | 5 |
| No. project leaders | 4 | 2 | 4 |
| No. interaction leader | 2 | 3 | 3 |

researchers with science communication background or interaction specialists with a background in research. Including both professional types in the selection of interviewees provided differing perspectives on the project and its aims, cultures of leadership, working methods and traditions. The choice for who would take part in the interviews was given to the project. In most cases, interviews included both leaders and thus allowed an analysis of their internal discussions also. The projects represented all three thematic programmes equally (Table 3).

The interviews were semi-structured and allowed space for the interviewees' own interpretations and sensemaking (Brinkmann 2014). They focused on the following categories:

- The aims of the project and societal interaction
- Interaction partners and reasons for the consortium composition
- Interaction activities and expected impacts; reasons for choosing them
- Stage of planning when interaction issues were introduced, and when planned interaction activities were timed for implementation
- Skills required from the research group

Analysis of data utilized both deductive, theory-driven analysis by focusing on the aforementioned four capacities and inductive content analysis (Bryman 2004) and inductive, data-driven analysis (Gioia 2004). The discussions were recorded and transcribed verbatim. A similar analysis was done on both the written interaction plans and the interviews, which were then compared for more in-depth understanding. Through this comparison it became evident that the interviews dominated as the information they provided was deeper and more analytical than the written SIPs.

The initial analysis was inductive and attentive to data, adapting the Gioia method (Gioia 2004, Gioia et al. 2013). The first order categorizations focused particularly on the logic of how interaction plans, partnerships and actions were designed, and reasons given for adjustments at the beginning of the projects. NVivo software was used for systematic coding of the interviews with the help of nodes derived from the conceptual framework. The second order categories of the analysis (nodes) were based on the terminology of the interview questions, including process, learning and utilization of expertise, following the conceptual framework. The second order categories used were deliberative decision-making, partnership formation, reflexivity, expertise and process.

The projects had only been on-going for six months at the time of data collection. The focus was on how the interaction plans and partnerships were constructed and how and why they evolved during the early months of implementation. This focused attention particularly on how the research

groups envisioned the role of interaction, its building and upholding during implementation.

The 13 projects were mainly led by university senior scholars and in most cases the interaction leader worked at the same university. However, partners consisted of a combination of researchers from universities and predominantly public research institutes. Civil society organizations (CSO), public agencies, companies and international institutions were included in the consortia (Table 4). Interviews are reported anonymously to uphold anonymity of the interviewees. The interviews are recorded in the open data service of the University of Lapland (<http://www.ulapland.fi/opendata>) as metadata. The interviews for this paper are described as metadata aiming to secure interviewees as natural persons according to the EU General Data

Protection Regulation Article 4. The interviews are documented with unidentifiable 4-string identifiers, and it is not possible to identify the persons quoted in the interviews. The first two digits of the codes are metadata identifiers, and the third and fourth digits refer to project type and person category respectively.

Results

In this section we present the results of the analysis. They have been organized in accordance with the research questions and combine different aspects of the dynamic governance model. The quotes have been derived from interviews from multiple projects under study. However, they are presented without identifying characteristics (e.g. programme, position of interviewee, gender, university) due to the very focused sample of one particular cohort of the SRC and the need to safeguard the anonymity of the interviewees.

Interaction practices in the projects

One of the main findings of the study is that interaction practices were strongly integrated into the research process itself, which is noted already in the SIPs. They were not treated as a separate part alongside or subservient to research. Interviewees reported that researchers approached societal interaction as a trade in which information moves in all directions to support the main aims of the project and the creation of new knowledge. Researchers expected to get ideas from and be challenged by partners outside the scientific community. There was a clear expectation of mutual gain and even dependence. In short, the project plans viewed goal-oriented interaction as a holistic guiding principle for the work.

As regards the practices such as citizen hearings and science communication, a clear majority of the interviewees considered these too traditional and out-dated. They fitted poorly with the active interaction approaches the projects had adopted. Hence, such practices were used as communication activities, separate from and more one-directional than

Table 4. Leadership organizations, interaction leaders and type and number of partners by thematic programme

| Thematic programme | Leader | Interaction leader | Other partners |
|--|---|--|---|
| Climate-neutral and resource-scarce Finland (PIHI) | 2 Universities 2 Research institutes | 2 Universities (same as PI) 2 Research institutes (same as PI) | 11 Universities 13 Research institutes 1 Company |
| Equality in Society (EQUA) | 3 Universities 1 Research institute | 2 Universities (of which 1 same as PI) 1 CSO 1 Government agency | 11 Universities 3 Research institutes 1 CSO 5 Public agencies |
| Disruptive Technologies | 5 Universities | 4 Universities (same as PI) 1 University of applied science | 21 Universities 11 Research institutes 1 University of applied science 1 CSO 1 Company 1 Public agency |

PI, principal investigator.

interaction. In most cases, these were outsourced services acquired from beyond the scholarly community. Communication practices were connected to short-term, or one-off, situations with little continuity or ability to provide support in managing changes in the long term.

Engineers are designing the technical equipment that will enable a new type of energy production. They need an understanding from the engaged disciplines in order to be able to do the design work. (5053)

One of the core aims in a clear majority of projects, according to SIPs, was to increase or deepen cooperation with societal partners through co-working methods. The focus on enhancing joint working methods rested on an understanding that the ability to identify problems correctly and find sustainable solutions is inherently dependent on a strong and open working environment. Interestingly, interviewees of about half of the projects also stated that their intention was to function as *intermediaries* between societal partners of different types. This included bringing together unlikely actors, even adversaries of sorts in e.g. environmental and care-related issues. The intention was to facilitate their discussions and thus help build functioning collaborative networks that have the courage to deal with uncomfortable perspectives. They intended to use the SRC project as a platform to tie the partners closer together in their efforts to solve shared problems, while using scientific knowledge production as a tool.

The industry has separate forest departments that run its factories in the outside world, and then the factory and the processes run their threshold for the exchange of information between them. The level [of knowledge exchange] is pretty high, it's now smooth for us now to go through the factory gate. (5043)

However, we rely on humanities research to anticipate what we get to know. It is not a similar way that we think now but from the point of view of anticipation of the future. This process indicated how long-term focused the researchers are and the high level of internationalisation of our stakeholders. (2086)

Consequently, the SRC required split between internal and external interaction was deemed irrelevant or badly focused

for evaluation. This was visible in SIPs in the form of overlaps. A clear majority considered the split to be artificial for projects that are geared to active interaction throughout and potentially beyond the lifetime of the project. Partners in long projects that need to meet changing needs of society must be able to adjust to changing circumstances and needs.

Another thing that really changed our plan, was better understanding of the goals and also the crucial point of how the Academy clarified these goals in the first round for us. (1182)

The project leaders did not expect all researchers in the consortia to adopt interactive approaches. However, most had ensured that those managing crucial tasks, such as work package leaders, were both willing and able to utilize interactive practices. Those holding central positions in the consortia had, according to the interviewees, been selected in part because of their capacities to work with different types of experts. Internal on-the-job training was also used to strengthen interaction skills of the researchers, alongside external communication training.

In all cases, societal interaction came into the planning so early in the process that it, according to the interviewees, wasn't possible to differentiate between the research and interaction. While the research challenges and goals may have formed the impetus for the projects, 10 projects in all three programmes noted that successful implementation of the project rested on constant juggling of ideas, needs and testing platforms between and across the partners. Such juggling allowed roles of initiation, critique and development to be played by all partners, and included the updating of the original SIPs at the commencement of the projects. The interviewees stressed that the approach leans on a strong sense of equality between researchers and societal partners. This working method was also what was expected to create societal impacts in the long term, which was also stated in nearly all of the SIPs.

According to the interviewees, the principles of co-creation were adapted broadly. They referred to it as an approach that assumes the planning and implementation to take place both in the research and practitioner communities. A similar presumption can be seen in connection to impact. The interviewees in all projects generally expected that the impact demand was targeted towards researchers only. However, they

directed a similar expectation back at the societal partners, be they policymakers, business actors or civil society organizations. The meaning of reciprocity was highlighted in the expectation of an equal partnership when it comes to serving their own interests and those of others.

For example, last week we had a future workshop, where we first presented our research on comparing Nordic future strategies for developing energy systems, something they might not have thought systematically to have business there. It was possible to discuss systematically about it, and then after that the group was analysed about the future and the mutual cross-effects of different dimensions with the expert group. It became a key discussion in Finland. (4211)

None of the projects settled for building a SIP on the needs of the scholarly community. The projects were mainly concerned with the national and European level, societally relevant themes, despite the SRC projects' focus on Finland. For example, several PIHI and TECH projects noted that digitalization is a broad theme which recognizes the importance of political decision-making. Researchers understood these as opportunities for the scientific community to intervene based on research results.

There are the traditional academic scholars, who are clearly more cautious and who, as such, do not really want to maintain a little more neutral attitude that we are now studying this matter. We had a plan accordingly, but now it has changed to [more realistic] level of actions. (3052)

Despite the societally oriented approach, the research groups considered research interventions and scientific frameworks to also be a good basis for broader societal action and applied an advocacy-based method to interaction. This approach was referred to as 'drizzling' in the interviews. 'Drizzling' takes place throughout the lifespan of the project rather than at particular points or timed periods in the process. The carrying idea of 'drizzling' is that knowledge is created and used through the interactive working methods in small parts. According to one TECH project, 'drizzling' resembles a leaking tap:

We drop absorbable amounts of knowledge on them often, as a continuous flow and in a way that links to the working realities of the partners, instead of pouring a bucketful on them all at once. It's not an on-off situation. (2153)

Take workshops for example. We drizzle knowledge about the process and ways of working, not so much the results. (3172)

The scientific process was made visible through cooperation, in addition to actual scholarly presentations. Hence, 'drizzling' provided an opportunity to implement interventions in a living lab type of environment, which encourages adjustments at all stages from planning and implementation and final evaluation. The work is strongly focused on building a more sustainable, collaborative relationship with public

decision-making bodies, civil servants, businesses and civil society organizations.

The project leaders ensured that the SIPs matched the policy planning, formulation and evaluation processes, and less the decision-making as such. The interviewees emphasized that stakeholders need to have evidence to support the decision-making process. Providing such evidence requires time that decision-makers seldom have, and an acknowledgment of the quality assurance processes of research. Researchers face problems if the evidence is based on hastily produced results, which have been put to use before being verified. All interviewees from the projects were aware of this contradiction either from own experience or research in the field. This had been considered in their SIPs by allowing time for discussions and utilising multiple methods to strengthen likelihood of success.

Focusing on policy planning, formulation and evaluation processes was an informed choice in most cases. Research groups applied the continuous interaction practice fully aware of the challenges it might pose to research quality. The interviewees distinguished activities with societal partners as those that are continual and close to the partners with a direct stake in the project, from those that were open to large target groups or the public and one-off events. Closed and continuous engagement practices supported the involvement of established experts. There was also room for lay people in open and unique operating models, but these engagement practices had no continuity.

And we've always been thinking about the idea, that stakeholders also get to know each other and develop [the project] and get ideas from each other. It's not just a matter between us and each stakeholder, but also a common ground for our actions. (2123)

Most of the projects reported that while they understood public debates regarding tensions between research quality and societal interaction, they did not consider it a problem. On the contrary, the interviewees noted that it was beneficial also from a quality perspective to subject researchers to new angles arising from non-academic interests. They needed to revisit how they could uphold research ethical principles while integrating societal interaction. This was seen as a natural part of all research projects. Interviewees linked the discussion to the politicized atmosphere surrounding the establishment of the SRC, which raised concerns about plans to strengthen political steering of independent research.

Capacities of dynamic governance

The projects placed strong emphasis on reflexivity in multiple ways. Over 75% of the projects were based on the idea that researchers alone could not find the right questions to pose, nor solutions within only their own or closely related disciplines. Reflexivity is in the SIPs highlighted by the importance given to the ability to communicate ideas clearly and openly between partners. Interviewees emphasized the importance of dialogical communication skills as a requirement for forming a joint understanding of the societal challenge being tackled and how it ought to be approached. This includes an understanding of jargon and the need to avoid it when discussing issues in a mixed group.

I think the idea in this interaction plan is that we are not getting dialogue to move on. It is for the discussion just because we need it but based on [goals and content of] this project. (3082)

Furthermore, it is the human interaction and negotiation skills more than conventional science communication skills, which were deemed particularly necessary in providing the basis for piecing together multi-disciplinary expertise. Interaction takes place in processes of knowledge creation as a mutual exchange in which all parties have the opportunity to share knowledge and ask questions.

Reflexivity, well, it's like a kind of negotiation with our partners. We all bring something to the table at a particular time. (5023)

The SIPs highlighted important operational and hands-on capacities, which support anticipation capacities. They show a practical anticipatory approach linked to a clear target orientation. According to interviewees, these capacities are utilized to prepare the partners better for future demands. This was not only evident for the project as a whole, but also to each interaction activity (workshops, events, etc.). The interviewees emphasized a systematic objective-driven practice even in relation to everyday routines such as meetings, communication (e.g. leaflets) and conferences.

It's a seize the moment kind of spirit, things change quickly. You have to build networks that spread the information forward, not just use your own events for it. (5031)

Further to support anticipation capacities, the personnel adopted rational time-management and prioritization practices, which tie the partners' work practices together but also allow on-the-job training. Interviewees in most of the projects and in all programmes reported having diverse career paths with work experience from industry, public services and civil society, in addition to academia. It provided them with deeper and broader understanding of working methods. Thus, they were able to choose the most fitting engagement and participatory tools from a larger toolbox than perhaps the average academic researcher. Their diverse backgrounds provided them practical skills on how to attract various groups, market participatory events to different organizations, and the argumentation and presentation styles that work on them. Interviewees from 70% of the research groups stated that they intentionally challenged familiar working methods within their consortia, in order to identify solution paths to complex problems.

We need to cross the threshold between the inside and outside of factories, otherwise knowledge doesn't move. We need to manage the entire chain to solve the problems so involving researchers with non-traditional backgrounds is key. (4151)

As for transdisciplinarity, researchers and their societal partners tried to combine not only their knowledge and expertise but also their interest in future developments of their fields. Their shared interests exceeded the limits of their

narrowly defined field and extended to the boundary areas between them.

The interviewees considered transdisciplinarity to be a self-evident part of their projects because the research themes and phenomena under study were highly complex and impossible to solve without reflecting on the linkages across fields. In the TECH projects in particular, the interviewees described their SIPs as ways of forming communities of experts that through projects address emerging problems rather than refining additions to the research plans. The implementation of SIPs provided a source for collection of complex data, and as such, interaction is seen inherently as a part of the research design. Interaction is a tool for identifying development areas that can serve interests both in the substance, sectoral and personal spaces that the partners have. While most state clear scientific goals, these are seldom considered to be the most important part of the project. Instead, the projects emphasized broader societal aims and deemed their interest in influencing political decision-making as part of the societal goals. Research is thus one of the crucial tools in reaching these aims.

The whole ecosystem is changing, we don't know what will happen [...] we at universities need to do our part, to build future scenarios and to be part of the change. (6143)

We share an interest in affecting society [...] business is melting away. There's a need for knowledge to find new business models that work. (6193)

A key finding regarding emerging working practices relates to the relationship between research groups and societal partners. These rest on how interaction and non-scientific partnerships are viewed. A differentiating issue between the projects relates to whether interaction is seen to be an in-built part of the project or an external "addition". This is strongly coupled with who are counted as being part of the core consortium and societal partners, and people who are seen merely as target groups for communication activities.

Forming a shared understanding was emphasized in all projects, and the term stakeholder was used to stress the meaning of all those who have an active *stake* in the project, ie partners of different types. This refers to researchers and societal actors alike. The need for in-depth, substantive knowledge was seen as a prerequisite for real progress, which frames the role of researchers. Close and continuous interaction ensured that the required perspectives were not only made visible, but that they were also systematically subjected to critical analysis by all partners. The interviewees considered it more likely to find a critical component through cooperation that challenges the conventional way of thinking and working. This realization was a driving force in most of the projects across the programmes.

We study an emerging phenomenon and need to collaborate in the long term, not just sporadically. This serves both the partners and our longitudinal research. (4142)

A main capacity highlighted by interviewees in most of the projects lay outside the pre-defined ones: attitude. While it may not compare to anticipation, reflexivity, transdisciplinarity and continuity as a capacity, it was nonetheless defined by the interviewees as an essential marker needed for success. The research groups stressed the importance of an open,

curious and confident attitude as a cornerstone for being able to access the creativity and knowledge of all partners. Furthermore, they emphasized that it is this attitude and attached humility that allowed them to embrace their gaps in knowledge but also tap into their strengths in a competitive manner.

These researchers have experiential knowledge on how the actors they want to influence work and at which levels knowledge is needed and used. This applies to all projects but in different ways, depending on whether their focus lay mainly on developing company practices (PIHI and TECH) or social practices (EQUA). In all the projects, the interviewees reported being experienced with societal interaction from different contexts. They were thus knowledgeable about how political processes function in practice and who has influence in such processes in their (academic) fields. This knowledge and translational ability were applied in pursuit of solutions to grand societal challenges.

Discussion

From a public engagement point of view, the Finnish SRC approach of requiring SIPs was a push to change the traditional academic (science) communication plan model to a one emphasising more varied, long-term and active interaction. In this study we see a clear pattern of active and continuous collaboration between those who produce new knowledge and those who benefit from it. They not only enhance co-creation but create conditions able to utilize new types of joint forums and open data. They encourage exchanges between researchers and stakeholders to co-produce new knowledge (Spaapen and van Drooge 2011; Pulkkinen and Hautamäki 2019).

The elements of dynamic governance are manifested in the projects through practices and capacities in different intensities. Dynamic governance of research and capacity development are coupled with the increase of participatory interaction (Trencher et al. 2014; Kazadi, Lievens and Mahr 2016; Muhonen, Benneworth and Olmos-Peñuela 2019). This coupling can be illustrated by grouping them into process, implementation and cross-sectoral factors. They provide an outlook on the role of practices and capacities in utilising interaction for shared benefit.

Process factors consist of the practices for utilising expertise in different phases of the project and the integration of interaction plans into research. The focus lies on the types of expertise and capacities that are needed to put interaction into action. This is manifested through reflexivity and an appreciation for a range of expertise in-built in projects to high degree, because of partners' previous experiences of close cooperation. In most cases, the research groups actively searched for ways to broaden their own perspectives, which they realized were not enough to find working solutions, with partners who could contribute different types of expertise. This operational model aligns with the logic of open innovation as a practical reflection of dynamic research governance, and the use of dialogical methods that spur contextual learning (Spaapen and van Drooge 2011; Alhanen 2013; Kazadi, Lievens and Mahr 2016). In an open innovation environment, researchers share an interest in influencing development of their field also through practical action.

The interaction intensity of process factors was high in the data. They highlight a goal-oriented approach and time-management practices needed for juggling multiple types of

tasks and dialogues among and between partners. Implementation factors including management were visible in the initial SIPs and would have been part of the ex-ante review as well as mid-term and ex post evaluation of implementation and impact creation.

The strongest intensities of interaction fall under implementation factors highlighting the knowledge needs of different types of partners and their abilities to utilize the accumulating knowledge. This relates to the capacity of research consortia to adjust to changes in circumstances, their own and partners' needs. Practices such as the drizzling approach and using SIPs to form communities of experts are key examples of implementation factors. The underlying elements related to the capacity to adjust lies in the broad previous experiences of collaboration across professional boundaries and a critical outlook on the limits of expertise. The intended impact differs depending on the logics on which the projects' SIP and its implementations are based. These can include scholarly styles, productional slogans and accountability slogans (Lauronen, 2022). Impact of SIP's is a key attribute of implementation factors, which is exemplified by the practices of researchers acting as intermediaries. The implementation factors develop during the execution of the project, and could be reviewed mainly in mid-term and ex post evaluation of projects.

Cross-sectoral factors constitute practices and capacities related to communication and how partners push for change in particular sectors. An understanding of stakeholder interests and shared goals are key elements in this factor group. Capacities and practices regarding collaboration with media and conventional communication are part of this factor but with low interaction intensity. Most cross-sectoral factors could be detected in initial SIPs, with only issues related to pushing for change being through interactive practices deriving from evolution during the implementation of projects. As such, cross-sectoral factors could constitute part of ex-ante evaluation of interaction, especially related to issues of timing of one-off events and use of outsourced services. They would also be reviewed in mid-term and ex post evaluation but likely to play a fairly small part in all phases, with the exception of longer-term activity processes pushing for societal change.

Regarding practices for better societal interaction, there is great variety, but they share a strong common trait: they are built to a high degree on the logic and goal of utilising contextual learning in pursuit of dynamism to cope with constant changes (Neo and Chen 2007; Spaapen and van Drooge 2011; Kazadi, Lievens and Mahr 2016). The core notion of integrating societal interaction into research follows the logic of open innovation and co-creation, in addition to a pursuit of societal impact. It makes public engagement an extension that exists alongside research and an endeavour to pool expertise to find solutions to shared problems.

In-depth understanding of the benefits of pooling knowledge and skills constitutes the basis for practises of societal interaction. Researchers reach out to societal partners to not only engage them but to *broker* knowledge, and exchange skills and perspectives to gain new ones. Such broker roles are attached to the institution and based on the actors' own expertise and role as academics. The role of knowledge brokers stems from projects involving actors from various institutions, highlighting the importance of different types of knowledge, and is thus related to proficient understanding of

research principles, needs of practitioners as well as systems perspectives. The data in this paper indicates that information accumulated in different institutions and the utilization of information produced a different impact pathway to different actors, giving the broker role of projects added value and permanence to results and practices (Cooper et al. 2020; Kangas and Aarrevaara 2020).

This aligns with the core idea of dynamic governance: the ability handling issues in a rapidly changing environment which requires continuous adjustment of policies and programmes. It is an approach to setting performance standards for responsible research and innovation. This systemic and contextual perspective contributes to the potential and transferability of new governance innovations. In the analysis of this paper the idea of systematic capabilities embedded in people and processes is highlighted in the SIPs, implementation of interaction and the ways in which the research consortia view their roles in relation to their partners and stakeholders (Pulkkinen and Aarrevaara 2017; Mulyana et al. 2023).

Based on our analysis, capacities of dynamic governance appear as two wholes rather than as four separate types. Reflexivity and trans-disciplinarity are strongly coupled and form a coherent approach to solution-based research. Reflexivity appears as negotiation that takes place in the processes of knowledge creation and circulation (Brown and Duguid 2001; Delanty 2001). A vision of co-design as a working method and a dialogic governance of the knowledge production process (Stilgoe, Lock and Wilsdon 2014) is a key defining element in how reflexivity is manifested. Above all, it is a question of attitude.

The coupling between reflexivity and trans-disciplinarity is further indicated by the background of many of the researchers, crossing of disciplinary boundaries and network environments. Their working histories are diverse and multi-sectoral, instead of following a clear academic career path. Such hybridity (Pekola et al. 2021) allowed them to apply different working methods and networks naturally. It should be noted that while the data speaks positively about such broad capacities, the realities of academic career structures and cultures may create obstacles when different types of merits and the balancing of contradictory demands are evaluated in universities (Pulkkinen 2020).

While reflexivity and transdisciplinarity are inherently skills-based capacities, anticipation and continuity appear to function as more strategic guiding principles for interaction. They are strongly linked to seeing continuous societal interaction as something that has the potential to boost development of entire sectors rather than isolated moments aimed at visibility. As such, anticipation and continuation appear as a form of foresight strongly focused on envisioning solution paths to grand societal challenges (Fuerth 2009). Conceiving continuous interaction with non-academic partners is, thus, a critical element in actively affecting future developments rather than simply responding to them.

Capacities of dynamic governance—anticipation, reflexivity, transdisciplinarity, continuity—are, according to our analysis, implemented in broad networks consisting of researchers and their societal partners aiming for societal transformation (Schneider et al. 2019). The prevalence of the network-model is based on its ability to address emergent

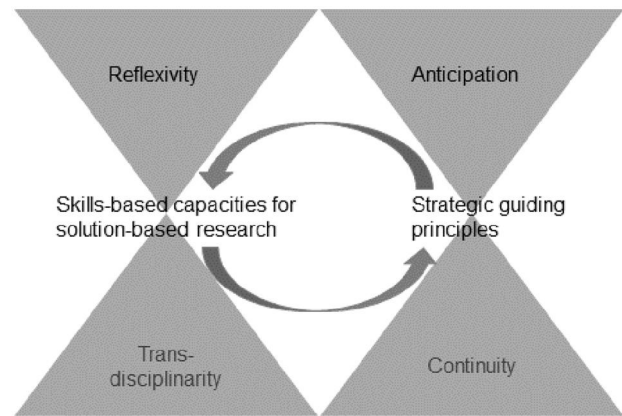


Figure 2. Two interconnected wholes of capacities for dynamic governance of societally interactive research.

problems. The SIP implementation serves as a source for the collection and analysis of complex data. Societal interaction is part of the research design in a way that partners become active subjects in the process, rather than being objects, which creates a direct link to societal processes. This close collaborative relationship contributes to reflexivity, which rests on mutual gain, is crystallized in the term ‘stakeholder’. Instead of being viewed as target groups of communication activities outside the consortium, societal partners and research groups are all seen as involved actors who share a ‘stake’ in the project, its methods, findings and applications. Knowledge is created in context.

SIPs are supportive of new capacity building within the academic community but also among their societal partners. As found in previous studies (Benneworth and Cunha 2015; Rask et al. 2018; Muhonen, Benneworth and Olmos-Peñuela 2019; Pulkkinen 2020), innovative societal interaction can effectively contribute to capacities of anticipation, reflexivity, transdisciplinarity and continuity. They are reflected in efforts to integrate non-academic networks into research routines and in creating space for researchers who also have experience outside academia. Based on interviews, the capacities of dynamic governance are particularly visible in researchers’ ability to combine analytical knowledge with non-academic expertise and process skills, and by being capable of organising these into the interaction practices of research projects. Tracking this ability and the capacity building efforts over a longer period of time could provide much-needed evidence on how the SIP-induced research affects scholars’ professional wellbeing. Such comparative analysis would also be needed to explore whether the dynamic governance models that emerged have indeed become part and parcel of the research groups’ and institutions’ work habits and structures.

Returning to the Finnish SRC context, the societal interaction plan requirement provided an impetus for potential behavioural change. The dual ex-ante evaluation, its expected equivalent in mid-term and ex post evaluation processes, as well as monetary incentives encouraged researchers to take manageable creative risks. However, the special conditions of the first call should also be considered. While the first cohort had both the advantage and disadvantage of not having predecessors in the SRC evaluation process, the consortia and

particularly their key leaders also consisted of individuals whose backgrounds fitted the new instrument well.

Interaction plans committed experts and knowledge utilizers in a way that implemented transparency and accountability in a new policy context (deBoer et al. 2015; Olssen 2016). It was not only the academic indicators of research results that mattered but also how knowledge and interaction between the scholarly community and the operating environment were realized (Benneworth 2013). This change should not be seen merely as a change in policy, but more broadly as a change in the legitimacy of the scientific community in society. Indeed, in the SIPs of each SRC project, legitimacy was a mutual concept because it was defined in the interaction between scholars and stakeholders. The analysis shows that there is no single interaction model, but different mutually agreed models depending on the operating environment.

From this perspective, it seems that the 13 projects were able to construct dynamic governance conditions in the planning phase and put these into action at the commencement of the projects. The projects were well prepared to implement SIPs but also aware of the need to critically review and adjust them. It is likely that these methods would not have been implemented without the SIP requirements for funding, at least not to the extent realized in the momentum of gaining the funding (Brankovic 2017). The formulation of SIP tools took shape in the early planning stages. This was essential to the emergence of a mutual consent approach. Each project was aware from the start that their extensive reporting systems also needed to cover both research and societal interaction, at mid-term and ex post evaluations. The initially emerging governance models were characterized by the commitment of key actors and project beneficiaries from the planning stage. When all actors had the opportunity to influence project objectives and interaction practices, the operational agenda and the results of the studies became inseparable.

Concluding remarks

In this paper we have investigated how societal interaction plans (SIP) can help orient research activities to respond better to the grand challenges of society. We found that the SIP model of the Finnish SRC, introduced a distinct model by requesting researchers to become deeply involved in stakeholder collaborations in their daily research activities and providing clear incentives for it. Despite the risk that such extended societal interaction could result in an overwhelming burden for academic researchers, the analysis shows an interesting SIP “operational model” emerging from the daily practices and perceptions of the consortia. This model is characterized by the metaphor of “drizzling” whereby societal interaction is not something spectacular or event-based aimed at high visibility but happens in small quantities and in a cumulative manner on a continuous basis. It combines practices and builds capacities of societal interaction.

Drizzling actions are well-targeted, resource-wise, goal-oriented and carried out daily. However, while the interview data shows enthusiasm, there is also awareness of the fact that juggling dual requirements on research and interaction puts a heavy load on project staff. It may provide both opportunities for learning and networking as well as manageable risk taking due to academic career structures. In long-term

projects this load could require additional mediation capacities also regarding the maintenance of consensus while simultaneously encouraging differing views from multiple types of experts.

When the Finnish SRC was established, it was innovative among other national research agencies in Europe. Several agency practices underlined non-economic social outcomes such as societal products as outputs and societal benefits as changes in society (Bornman 2012; Bozeman and Youtie 2017). Yet, the societal interaction plan approach differs from this policy. The role of knowledge utilizers is part of the process to define research, focuses on the early stages of planning and stretches through the lifetime of the project with a goal of sustaining the networks. The SIP model reflects a research and innovation policy that has expectations of participatory interaction from the initial planning stages onwards, and encourages a critical, reflexive operational model. From this point of view, societal interaction includes the process and goals for societal impact, not only the activities. As such, the SIP model highlights the importance of ex-ante evaluations of not only scientific excellence but also that of the dynamics of societal interaction.

Based on data for this paper, the new SRC funding instrument created conditions that can spur behaviour change in academic communities. The more there is complexity, different societal perspectives and voices involved, the more there is need for practical tools, dialogue and approaches for managing the connections through dynamic solutions. To facilitate a transition, the relevance and usability of the SIP model need to be established through further empirical research. Our results suggest that their main benefits lie in better legitimacy, strategic planning and more effective mobilization of academic and non-academic resources, without compromising research integrity.

Encouraging researchers to involve decisionmakers, policy planners, and other key stakeholders also stimulates them to acknowledge the interdependencies and mutual gains in solving shared problems. In the evolution of societally interactive research, it is crucial to understand that one of the characteristics of successful consortia lies on building the interaction solidly on the knowledge production needs. A functioning interaction plan is thus less focused on visibility and consensus, and more on strengthening the dynamic governance of interaction by mixing complementary expertise in a manner that embraces difference of interests. This calls for strategic ability and a goal-oriented approach to manage knowledge across boundaries (Carlile 2004). For ex ante evaluation this poses a challenge of how to recognize a partnership where interaction is truly based on a co-creative model and serves the long-term interests of the entire consortia, including societal partners. Identifying these is a matter of mixing different types of expertise also in the evaluator groups to ensure that they understand the academic as well other societal aspects of the topic and consortium.

The Finnish SRC and its experiment with SIPs provided guidelines and conditions, while leaving room for creative solutions to define the topic and interaction approach. Whether this is in the interest of responsible research is a topic for further research. While the orientation of the SIP model is therefore right, more knowledge of its long-term effects on research funding and performing organizations, as well as individual researcher, will be needed.

Studying the working logics of integrating societal interaction into research raised questions among fellow academics. In trying to understand the complex dynamics of societal interaction Paul Benneworth appeared as a critical discussion partner. Paul had the ability to listen intensively, ask horrifically pointed questions and then remain interested while you navigated the way to answers. He did this as we respectfully disagreed on some aspects related to co-creative practices and their role in research. We shared an interest in exploring the societal impacts of research, and the discussions on the non-linear dynamics of impact and its evaluation became a lifeline of sorts. In the endeavour to make sense of the findings, he acted as a sounding board and encouraged me to follow a solution-oriented path. The differences in our backgrounds were a source of learning and sparked fun conversations that never lacked wit and humour. For me, this was the essence of Paul's excellence: as a professor he was amazingly sharp in his thinking, even piercing (and usually right) with his critique, but always a respectful, kind and constructive person with a twinkle in his eye.

Thank you, Paul, a respected colleague, in memoriam, Kirsi Pulkkinen.

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