A Plurality of Voices

The Dutch National Research Agenda in Dispute

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In 2014, a new science policy framework was launched by the Dutch Ministry of Education, Culture and Science (*2025 Vision for Science*), heralding the development of a unifying agenda for research in the Netherlands. The agenda was to set out priorities and establish interrelationships between the research programmes of universities, research institutes, private sector companies, and other knowledge organisations. Ambitious guidelines and expectations were formulated. To mention only a few:

> The National Science Agenda is to be a 'co-creation' of researchers, scientists, the private sector, civil society, the government and other stakeholders. […] The agenda will include a limited number of themes, selected on the basis of existing scientific strengths, societal challenges and economic opportunities. The research field as a whole will combine its strengths to achieve the greatest possible impact. […] The National Science Agenda will appeal to the imagination; it will inspire and challenge both the research field and society itself to achieve momentous breakthroughs. It will create a better match between research on the one hand, and social and economic needs and opportunities on the other. It will clearly set out those areas in which the Netherlands is to stand out through truly excellent research. (ibid., p. 24)

In 2015, at the government's request, a coalition of umbrella organisations of the Dutch knowledge and innovation system (the so-called Knowledge Coalition) set out to develop and formulate the National Science Agenda. Amongst individual researchers these ideas and ambitions did not meet with universal enthusiasm. Quite a number of academics were sceptical and saw in the agenda the threat of a central top-down steering mechanism that would restrict their room for manoeuvre.

In the assignment letter to the Knowledge Coalition, the government added as further challenge the requirement to develop the agenda through an open process that would transcend existing institutional lines. The Knowledge Coalition met this particular challenge by organising a broad participatory bottom-up process. Anyone interested – whether universities,

research institutes, civil society organisations, private companies, governmental organisations, or individual citizens – was given the opportunity to submit research questions. This approach met with a lot of enthusiasm and high expectations, but also with guarded reservations or scepticism. This time, some academics feared decentral bottom-up steering by the man in the street.

Almost 12,000 questions were submitted, far surpassing expectations. Juries composed of top researchers from all fields of the knowledge system grouped the questions into clusters and formulated overarching questions for each cluster. These were discussed in three conferences focusing on three different perspectives: Science for Science, Science for Society, and Science for Competitiveness. This was the basis for a further aggregation into a final number of 140 questions. In this way the questions submitted by the public were used as building blocks and sources of inspiration for the formulation of the 140 overarching questions which form the centrepiece of what has since been designated as the Dutch National Research Agenda.

This bottom-up process received much attention in the media and raised a lot of interest and enthusiasm. During the months in which the agenda was being developed, numerous bigger and smaller meetings, conferences and other forms of communication were organised, bringing science and the public into touch. This participatory approach contributed to enhanced public support for science and innovation. The involvement of the juries in constructing the agenda was another key success factor. Under the aegis of the Royal Netherlands Academy of Arts and Sciences and The Young Academy the juries were composed of eminent scientists. This manifestly resulted in growing support amongst the scientific community itself.

In the end, the agenda was well received and welcomed not only by the Dutch cabinet and the public at large, but also by the majority of the constituencies of the Knowledge Coalition. This was no mean accomplishment. At one stage or another, practically all parties in the knowledge and innovation landscape had expressed fears that the agenda would lead to a reallocation of research funding to their detriment. Diverging interests had to be aligned and expectations had to be managed.

Although the Dutch National Research Agenda does not aspire to be an all-inclusive agenda for science at large, its scope is nevertheless ambitious. The agenda focuses specifically on interdisciplinary and inter-sectoral challenges and as such stretches across the fields of science, technology, and innovation. It covers all sciences and academic fields of interest (natural sciences, life sciences, social sciences, humanities, and technological sciences)

and embraces all types of research (basic research, strategic or policy-oriented research, applied and practice-oriented research). Consequently, it addresses and connects many different players within the Dutch knowledge and innovation system.[1]

In trying to cohere and integrate these various players and types of research under one single overarching agenda, it was necessary to take into account and come to terms with diverging perspectives, interests, ambitions and incentives. At times this met with resistance and led to fierce debates. Three disputes particularly emerged in this respect. The first was about the very notion of a research agenda and raised the question of whether a national research agenda could be to the detriment of curiosity-driven, unfettered research. The second dispute, closely related to the first one, was about the possible detrimental effects of an agenda focusing on a limited number of priority themes on the existing rich and multiform scholarly landscape. The third dispute started with questioning the wisdom of consulting the public at large in drawing up the national agenda and focused on issues of legitimacy and public support.

This essay reflects on these three issues by discussing the merits and shortcomings of some of the arguments raised. It also reflects on how choices made in developing the Dutch National Research Agenda relate to these disputes. In this way the essay situates the agenda in an analytical context that touches upon the nature of research and the sociology of science.

The research agenda in relation to unfettered research

A strong voice in the first dispute was that of academic proponents of curiosity-driven research. Amongst them the initiative to draw up a national research agenda met with scepticism or sometimes even outright hostility. They advocated unfettered research and experienced the national agenda as a threat, arguing that scientific advance cannot be steered, planned, or programmed. The free search of the human mind for new knowledge and insights, they argued, would only be hampered by an agenda. Indeed, the very concept of agenda-led research went against their grain.

1 For that reason, in this essay the word 'science' is used in a broad sense covering all fields of systematic intellectual enquiry, including the social sciences and the humanities, and referring to research undertaken by all players within the national knowledge and innovation system, including private sector R&D.

Over time, many of those who were very outspoken and critical at first have become less fierce or even sympathetic to the Dutch National Research Agenda. But this does not hold for all of them and the agenda is bound to meet with this criticism time and again. No doubt, the persistence of this debate is related to the equally persistent drive of policymakers and funding agencies to earmark financial resources for specific social or economic purposes. In a context of fierce competition for scarce financial means, such choices unavoidably touch upon sensitive nerves and trigger emotional responses. There is good cause, therefore, to level-headedly scrutinize the reasoning behind these opposed lines of thinking. For is there truly a contradiction between agenda-led researches on the one hand and unfettered research on the other? It would seem that misconceptions are at play.

Free or unfettered research is sometimes referred to as 'blue skies research'. This metaphor indicates the mind transcending the limitations of earthly existence. On the ground, interests and agendas rule and mire the researcher in the mud of society. Such limitations hamper the curiosity-driven flight to great heights and new vistas. Unfortunately the metaphor confuses issues. It suggests that blue skies research is essentially basic research that needs to be distinguished from applied research driven by societal challenges and agendas. This confounds two different oppositions, one of basic versus applied research and another one of untied versus agenda-led research. Neither of these two distinctions is as pertinent as may seem.

Scientific progress shifts the frontiers of human knowledge. There is a widespread conviction that ground-breaking research is mostly basic in nature and that scientific breakthroughs only gradually find their way towards useful applications in society, sometimes after a delay of many decades. There are indeed many examples of such a course of affairs. But it is certainly not the only way in which new knowledge is created and utilized. Sometimes scientific breakthroughs – even fundamental paradigm shifts or the emergence of new disciplines – spring directly from social developments. One could think, for example, of the historical relation between bookkeeping and algebra (Crosby, 1997, pp. 204-220; Murray, 1978, p. 205; Soll, 2014, pp. 29-70) and between the insurance business and calculus (Tracy, 1985, pp. 212, 213).

The lineal knowledge chain that stretches from basic research via applied research to valorisation is only one of many patterns of knowledge creation and uptake. Sometimes basic breakthroughs find an immediate application in society. Applied or practice-oriented research, in turn, can give rise to new basic questions. Applied research is not to be confused

with application. It is, indeed, research in which new knowledge is created, if only by merging or re-contextualizing existing knowledge. Basic and applied research can inform and enrich each other. The intellectual efforts involved are not at all different.

What about the other opposition, the one between untied and agenda-led research? This distinction also is not as clear-cut as it seems to be at first glance. How untied or free can scientific research really be? Within academia, research agendas abound. Every faculty, institute, or research group has an agenda. Such agendas focus research efforts, including curiosity-driven research that is not geared towards social challenges but towards questions that are relevant for the academic community itself. Such agendas do not come about haphazardly. They are based on foreseen and aspired scientific value.

Although disregarding economic value or social relevance, curiosity-driven research is not without direction or purpose. Next to economic values (profit, work, affluence), social values (well-being, social cohesion, peace and security) and ecological values (sustainability, biodiversity, conservation of nature), the creation of scientific values (insights and explanations, sense giving, knowledge as capability) should be recognized as a fully valid motive in itself. This motive informs agendas for curiosity-driven research.

How free can free science be in practice? Science is organized in disciplines. The designation 'discipline' is telling. Students are disciplined for years before being able and allowed to practise science. A researcher needs to learn and respect the – often tacit – codes of the discipline. Imparting knowledge to students is both a cognitive and a social initiation into the norms and customs of the field of study involved (Abma, 2011, p. 36; Kreber, 2009, pp. 19-31).

Freedom of research is relative in yet another sense. At the start of a scientific career many courses are open. However, a young academic is expected to abide by the agendas of supervisors, research schools, and the strategic plan of the institution he or she is affiliated with. At a later phase in life, a successful academic gains influence over such agendas through participation in committees and advisory boards. But by then his or her personal research efforts display path dependency based on the career path already travelled. A scientific career implies complying with many agendas, norms, and obligations. These limitations are accepted willingly and hence are not seen as constrictive. Freedom of research, therefore, is a matter of perception.

Of course, there is nothing against designating research geared towards the creation of scientific value as untied research, if this is meant to indicate that it is not motivated by social or economic goals. But the distinction

with demand-led research should not be blown out of proportion. The distinction is not about research with and without a goal – the goals merely differ. Neither is it about research creating value versus research that is not creating value – it is only the types of value that differ.

Another argument sometimes raised against agenda-led research is the notion of serendipity. Scientific breakthroughs often arrive unexpectedly. They may come about as unintended side-effects of research into something else. This fact of life is brought forward as a plea for untied research. But such reasoning is misdirected. It implicitly assumes that untied research allows more space for serendipity than agenda-led research. However, serendipity needs no such podium and strikes at will. Serendipity occurs within every type of research, whether basic or innovation-oriented. Serendipity does not shy away from socially or economically motivated research agendas and is not lured by their absence.

Different types of research, therefore, are not all that dissimilar. The research agendas may differ, or the institutional settings or the conditions for research funding, but all types of research focus on creating new knowledge. A national research agenda should offer room for all these types of research. And this is precisely what the Dutch National Research Agenda does. It has been drawn up in such a way that it not only allows room for but also connects all types of research and research questions. The themes have been chosen and formulated to combine basic and applied research; connect curiosity-driven and innovation-oriented approaches, and bridge disciplines and sectors. The Dutch National Research Agenda transcends all such distinctions.

Disciplinary diversity and thematic focus

Another field of dispute encountered while developing the Dutch National Research Agenda was the fear that focusing on interdisciplinary themes would pose a threat to the wealth and diversity of the disciplinary landscape. Forcing research agendas into the mould of a limited number of thematic priorities, it was argued, would lead to a deterioration of the rich and multiform knowledge ecosystem. Small disciplines would run the risk of dwindling, facing the threat of extinction. As a result, the system at large could become less responsive to emerging possibilities and less resilient in dealing with external threats.

This dispute is even more intricate than the one about the threat of agendas to untied research, although there are certain similarities. It touches

upon the very nature of the disciplinary organisation of academia and its state of tension with interdisciplinary research. In order to explain how the Dutch National Research Agenda dealt with this dilemma, it is necessary to delve into what disciplines are all about.

Disciplines do not reflect naturally given fields of reality. They are historical constructs created in the process of practising science (Abma, 2011, pp. 25-41; Rip, 2002, p. 125). They are created by people who identify objects of scientific inquiry, conceive of concepts and theories, conduct research, establish institutes for research and education, develop curricula, teach students, and create scientific journals. Disciplines are man-made ways of organising research and education. They grow into institutional frameworks that change over time and may differ from country to country. A discipline, therefore, is not a natural phenomenon but part of the sociology of science, useful for the organisation and reproduction of higher education and research.

Disciplines are both institutional and conceptual units (Becher, 1989, p. 20). The disciplinary framework cuts up reality into separate fields. The organisation of research and education in specialized disciplines allows for more in-depth knowledge creation. But this institutionalization of the process of knowledge creation also brings about constraints and lock-ins (Rip, 2002, p. 132). While reality is integrated and interdisciplinary in nature, disciplines compartmentalize research into silos and direct thinking into preset courses.

The social organisation of science is a play of inclusion and exclusion. Disciplinary knowledge is specialized, validated knowledge that is made available to some and not to others. Academics draw and sometimes dispute border lines with neighbouring disciplines. They demarcate their knowledge and insights from the ideas of others, especially from amateurs and lay practitioners. They claim exclusive authority in judging validity of knowledge in their field. And they constantly guard and strengthen the boundaries of their discipline (Abma, 2011, p. 31). This is particularly the case when career paths and other incentives are geared towards disciplinary excellence.

The partitioning of funding is another important underlying factor. A lot of public funding is earmarked for specific disciplines or groups of related disciplines. Moreover, financial resources are not equally divided over the various disciplines. Some disciplines have access to more funding windows than others, and the success rates in applying for research funding vary substantially from one field to another. This fuels competition between disciplines rather than cooperation.

As a result of all this, disciplines develop vested interests and mark identity by creating their own cultures with specific discourses, practices and rituals. This promotes their stability and reproduction, but may hamper effective interdisciplinary collaboration. Differences in tacit knowledge, norms and publication habits – not to mention diverging perspectives on ontology, epistemology, methodology, and pedagogy – are barriers to mutual understanding and adjustment (Donald, 2009, pp. 35-49). Such barriers may be even stronger when it comes to trans-discipline, cross-sector research involving non-scientific players (policymakers, enterprises, civil society, consumers, patients, and other end users) who stand to benefit or suffer from the outcomes of research. Divergent objectives and time frames can make such research collaboration quite a challenge (Molenaar, 2008, pp. 15-22).

Nevertheless, these forms of collaboration are urgently required. Humanity is beset by interrelated global challenges: wicked problems characterized by conflicting values, political pressure, moral confusion, and diverging economic interests. The complexity of these challenges can only be addressed through far-reaching systemic changes and transitions. Researching and meeting this complexity requires the involvement of many different parties and approaches, new connections and alliances. It calls for research integrating scientific and extra-scientific knowledge, experience and practice in problem-solving, taking the diversity of 'life-world' and scientific perceptions into account and linking abstract and case-specific knowledge (Edwards, 2011, pp. 7-16; Gibbons et al., 1994, pp. 1-17; Nowotny et al., 2001, pp. 48-55). Disciplinary silos do not easily allow for such partnerships (Kreber, 2009, pp. 19-31).

Still, the difference between disciplinary research on the one hand and interdisciplinary or trans-disciplinary research on the other should not be overstated. They have a common core situated in the very nature of knowledge creation. Knowledge creation is a social process, a collective endeavour. It requires the formation of an epistemic community, a community of peers understanding one another and collectively developing shared conceptual interests, lines of inquiry, and the practice of creating and validating new knowledge (Becher, 1989, p. 61).

Intriguingly, one can often observe interdisciplinary breakthroughs crystallizing into the birth of a new discipline (Rip, 2002, pp. 131-138). When effective, a newly formed epistemic community evolves most naturally into a discipline since this is the dominant way of organising knowledge production in modern societies. A successful epistemic community grows and diversifies. Different perspectives develop into specializations;

specializations grow into sub-disciplines. Informal lines of communication thicken into organised working arrangements. The new growing body of knowledge is introduced into higher education. A curriculum develops. A specialized journal is published. The institutionalization of the new discipline is underway.

In fact, most disciplines can trace their history back to an interdisciplinary or trans-disciplinary origin (Henry, 1997, p. 5). What presents an interdisciplinary theme today may grow into an academic discipline tomorrow. It is often argued that interdisciplinary research should be built on deeply rooted disciplinary work. That may be the case, but we must be cognizant that the deepest roots of disciplines are often interdisciplinary and cross-sector in nature.

Disciplinary and interdisciplinary research approaches, then, are not necessarily mutually exclusive or hostile to one another. Systemically, the one cannot exist without the other and for that reason academia needs to embrace both (Abma, 2011, p. 150; Rip, 2002, pp. 131-138). A too narrow focus on disciplinary excellence in splendid isolation may be fruitless in the long run. Disciplinary boundary work, therefore, should focus as much on building alliances and entering into partnerships as on guarding boundaries and defending territories. The sociology of science displays a geostrategic game played out in the landscape of academic 'tribes and territories' (Becher, 1989, p. 36).

A vibrant science, technology, and innovation system needs even more bridges and corridors, linking academia with extra-scientific players and sectors. It requires the possibility to reach out and connect beyond disciplinary and sector boundaries. The more diversified and multiform the knowledge landscape is, the greater the possibilities for teaming up and entering into new and unexpected alliances.

For this reason, a focus on a limited number of priority themes may not be in the interest of an effective national science and innovation system. Depending on the extent of the knowledge system, a too narrow specialization can indeed make the system vulnerable, less resilient, and less responsive to emerging threats and opportunities. In developing the Dutch National Research Agenda the Knowledge Coalition came to realise that in the comparatively highly developed and diversified Dutch knowledge and innovation landscape, building bridges across sectors and promoting inter- and trans-disciplinary research alliances is quite crucial and even a precondition for meaningful thematic prioritization.

The agenda has been drawn up in such a way that it can be used as an instrument for connecting different players in the knowledge and

innovation system, for building new alliances, and for the joint programming of research. Practically all existing institutional research agendas to be encountered in the Dutch knowledge system have been identified and related to the questions of the Dutch National Research Agenda. Consequently, the agenda can be used as a map for exploring the science and innovation landscape to find potential partners. Furthermore, the instrument of 'routes' through the agenda has been developed. A route is a collection of agenda questions touching upon the various dimensions of a complex challenge, thus potentially linking a wide variety of parties who may be interested in teaming up to jointly meet this challenge.

The agenda has identified important issues and questions that call out for research and carry the potential for scientific breakthroughs in the years to come. These questions cover a wide range of topics and challenges. With the help of the route instrument, further prioritization of research themes to focus on can evolve through a bottom-up process addressing and tapping into the intellectual resources of the scientific community at large.

Legitimacy and public support

The third dispute started by questioning the approach followed in developing the Dutch National Research Agenda through consulting the public at large. As mentioned, this broad invitation to submit questions met with positive surprise and growing enthusiasm, but occasionally also with perplexity and confusion, both amongst researchers, practitioners, and the public at large. Although many acknowledged the importance of public support for research funding and recognized the bottom-up process of developing the national agenda as conducive in this respect, some wondered how an uninformed lay public could possibly set priorities for research.

This dispute both touches upon the self-image of academics (or researchers in general) and on the authority vested in science and the legitimacy thereof. It therefore merits a reflection on the nature of this authority and its role in society.

As mentioned, university education is a process of imparting guarded, specialized, validated knowledge. Not everyone is allowed to enter academia and benefit from this. There is selection at the gate. And not every student that enters succeeds in achieving the qualifications required to graduate. After successfully completing a university education, further steps await those who aspire to an academic career. In the process they

may reach increasing levels of authority and legitimacy, each level with its own gatekeepers. Important steps on the ladder are marked with specific rituals. In this we can recognize the structure of the medieval guild system on which the earliest universities were modelled (Grant, 1996, pp. 34-39). It feeds a culture of exclusivity, which does not go unnoticed beyond the halls of academia.

Academia is one of three professional fields in which authority is marked by wearing a gown at official occasions, the others being the clergy and the judiciary. What these professional fields have in common is that they all set standards for and evaluate truth, validity, and righteousness and have the authority to disclose falsehood, errors, and transgressions. The gown symbolizes the legitimacy of the office bearer to wield this authority. But this legitimacy cannot be taken for granted. In recent decades the clergy has lost much of its former authority and the role of the judiciary is increasingly questioned and criticized nowadays.

So far academia has been spared such deterioration of authority (Hagendijk and Dijstelbloem, 2011, pp. 261-275). In fact, in the Netherlands there is substantial public support for and general interest in science. Mass media pay attention to scientific results and the public flocks to science festivals and science cafes. But continued trust in academia should not be counted on as a matter of course. Cases of plagiarism and falsified research badly hurt the reputation of science (Nelkin, 1996, pp. 114-122). Sometimes the outcomes of research are contested in society, because social impacts and ethical aspects have not adequately been taken into consideration (Kitcher, 2011, pp. 1-40). People increasingly use information on the internet to form their opinions. Medical practitioners are confronted with articulate and critical patients questioning their diagnosis. The gradual penetration of market principles in academia may further undermine the authority of science in the long run (Radder, 2009 and 2010).

This authority, therefore, needs to be carefully maintained and the legitimacy of scientists to wield this authority needs to be prudently justified and substantiated (Dijstelbloem et al., 2013, pp. 12-15). A most direct way to do so is to produce and widely communicate results. Scientific breakthroughs that help solve urgent problems and meet with priority needs are always welcomed. Many of the questions submitted for the Dutch National Research Agenda indeed relate to such problems and priorities. But this utilitarian function of science is certainly not the only important dimension. It is heartening to see that many individual citizens submitted questions that have no direct social relevance or economic value but touch upon the fundamentals of life and the universe.

Providing meaningful answers to such basic questions must be recognized as meeting an important social need. There is a lot of interest in the origins of the universe, the earth, life, and mankind. But also in a wider sense many look to science for sense giving and for interpreting man's position in the world. The social sciences and humanities play an important role in providing conceptual and normative frames for debating complex challenges (Radder, 2014, p. 5). This dimension is often overlooked by politicians and science policymakers, but it is crucial for public support and the authority of science. There is wide support for these roles of science, although the public may not at all be aware through which mechanisms the related research is funded.

In this context pleas by academics for additional funding for free and untied research can be inexpedient and counterproductive. This is the case when such advocacy takes on a denunciative form, denying policymakers, funding agencies, or the public at large the right or competence to earmark funding. Enhanced sensitivity for how such advocacy may be perceived would be wise. As it happens, the plea for free and untied research perfectly matches the self-interest of researchers since it enlarges the scope for the research they choose to conduct. When the argument is added that researchers themselves are best qualified to assess which research should be funded (the Haldane principle), the perception of the pursuit of self-interest grows stronger. This unavoidably touches a nerve with funders and policymakers. Advocacy that does not take their role, responsibility and mindset into account may do more harm than good.

Individual academics would do best to emanate the importance of all types of research. And the best way to do this is to actively reach out to the general public and to specific audiences. In fact, consciously building new audiences could be considered a task of growing importance for academia and non-academic research institutes (Dijstelbloem, 2014, p. 49). To the extent possible, such audiences can be involved in drawing up research agendas and in the research process itself. This will enhance trust, enlarge public support, and legitimize the authority of the sciences.

Concluding remarks

Looking back upon these three disputes one can observe that the process of creating the Dutch National Research Agenda has resulted in a meeting of minds, both within the scientific community itself and beyond. New partnerships already emerged during the process of harvesting questions

and formulating the agenda. Many more partnerships are likely to follow in the years to come. The disputes have raised the level of mutual understanding across the partitioning of sectors and disciplines. But these disputes are far from over, as the various contributions to this volume attest, and this is as should be. Reasoning will continue to be deepened and new insights will emerge. The Dutch National Research Agenda will continue to spark off debates on science policy and on the sociology and philosophy of science.

The broad public consultation that was the start of formulating the Dutch National Research Agenda and, subsequently, the many meetings that were organised during the process to bring the public into contact with scientists have contributed to enhanced interest in and public support for science. In this, the process of developing the agenda met with some of the principles of responsible research and innovation as advocated by the European Commission (2013).

Equally important was the involvement of the scientific community in processing the many questions submitted by the public and in formulating the overarching questions, thus embracing and making the most of this hugely varied input and taking seriously the bottom-up process of formulating the agenda. In doing this they discarded or weakened many of the misgivings and doubts they experienced at the start, such as discussed above, and developed a measure of ownership over the Dutch National Research Agenda.

In the long run, the success and impact of the Dutch National Research Agenda require not only sustained interest and involvement of the public, but also engagement with and commitment to the agenda by the scientific community itself. This calls for continued dialogue and communication. The present volume aspires to this effect.

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