THE DUTCH "WETENSCHAPSVISIE 2025": ILL-INFORMED, NARROW MINDED AND MISCONCEIVED[#]

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1. Introduction

On 25 November 2014, the Dutch government published its vision on science, the "Wetenschapsvisie 2025: keuzes voor de toekomst", in which indeed several choices for the future are proposed. These all follow from one major consideration: the desire to steer science in such a way that it becomes (even) more useful for Dutch society and to the Dutch business sector in particular. I think, and will motivate in this document, that this idea is narrow-minded and misconceived. I am strongly convinced that following up on this idea can only be counterproductive, i.e., that it will hurt Dutch science and also the competitiveness of the Dutch economy.

Dutch politeness implies that I will say something positive about this latest science policy document. The "Vision" indeed acknowledges that the Dutch science system currently is performing very well: with limited means (i.e. government expenditures at the EU and OECD average, but limited outlays from the private sector), it belongs to the top world-wide (p. 5). It proposes that research in schools of higher vocational training be given more emphasis and that more attention be devoted to science communication and the popularization of research. Personally, I believe that multidisciplinary research indeed should receive more attention, but I acknowledge that I am not completely sure. The last sentence of the "Vision" is the best one, it acknowledges that the essence of science is curiosity about why and how things are as they are.

However, Dutch frankness also insists that, for efficiency's sake, I am open and honest about what I think about the document. In short, I find it very disappointing. Rather than showing an admiration for science, it shows distrust, and a belief that the government, by steering and controlling, can improve matters. There is no recognition of the fact that such measures may

[#] This reaction on the "Wetenschapsvisie 2025" is written in English to allow easy communication with the researchers in the Netherlands that are not fluent in Dutch. About 50% of the PhDs in the Netherlands is non-Dutch ("Vision", p. 64), as is 97% of the Research Master students in Economics at Tilburg. These percentages also cast doubt on the claim in the "Vision" that, in the Netherlands, interest in science increases (p. 43).

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stifle curiosity or may induce young researchers to turn their back on the Netherlands. Even in areas where the Dutch government clearly could (and I think, should) make a difference, such as with respect to the very low numbers of women in science (where the Netherlands is at the bottom in Europe), it is just proposed to follow European initiatives (p. 72).

This example points to what is generally wrong with the "Wetenschapsvisie 2025". The "Vision" points to things that are wrong in the Dutch scientific ecosystem, or in society more generally, and then concludes that, to improve this, the core of this scientific system (academic research) should change. Nowhere in the document is there a signal of the writers and the responsible ministers having considered the possibility that it might be the other parts of the system that might have to change. For example, in relation to the "knowledge paradox" (the fact that results from scientific research are little used by Dutch business and the government), there is no openness to the idea that the problem might lie more with the (low) absorptive capacity of the demand side than with academic supply. The "Vision" states that scientists should be aware of societal demand and that societal problems should be a source of inspiration (p. 39), but rather than acknowledging that they clearly already are, and have always been, it suggests that they are not. Indeed, evidence to the contrary is systematically neglected.[1] Although there is a lot of talk about excellence in the document (with the term, perhaps, being used too often), we see the typical Dutch attitude of trying to cut off everything that protrudes above sea level. Rather than trying to stimulate excellence, academic research is punished by loading onto it all kinds of other things, until it, finally, will crumble.

The remainder of this document is structured as follows. I first provide six general comments that disqualify the "Wetenschapsvisie 2025". In essence, I show that the document would not have passed a decent refereeing process as academics know it. Next, I discuss, and reject, the idea of drafting a Dutch Science Agenda. Thereafter, I focus on the proposal to devote more attention to valorization, which I consider to be misconceived. Finally, I discuss the proposals related to academic talent, which, in my view, demonstrate serious lack of knowledge about how the academic system works.

[1] As in the document "Drijfveren van onderzoekers" that was sent to parliament along with the "Wetenschapsvisie 2025". http://www.rathenau.nl/publicaties/publicatie/feiten-en-cijfers-drijfveren-van-onderzoekers.html

2. General Comments

I limit myself to six general comments.

1. A non-scientific science policy document

The "Wetenschapsvisie 2025" is a science policy document. It is not a scientific paper; this could not be expected. However, it could have been expected that a policy document dealing with science would display a more scientific attitude and would adopt a more scientific approach. The "Vision" does not show any ambition in that direction. It just reads as any other policy document of the Dutch government. On p. 57, the document acknowledges that, currently, there is no integrated view on how the Dutch science system is functioning. This openness is to be praised, however, such a statement about the facts can only be followed by the decision to gather more information and do more analysis first, not by the drastic and untested proposals as the ones that are made in this document. The credo should have been: if you don't know that the situation will improve, do nothing (or experiment on a small scale).

Scientists are characterized by four properties: curiosity (about why things are as they are and/or how they could be improved), creativity (in generating ideas), a critical attitude, and discipline (the vigorous testing of the ideas before they are accepted). The "Wetenschapsvisie 2025" does not show signs of curiosity or creativity and a critical attitude and discipline are lacking in the document. Science proceeds in three stages: investigation of the facts, analysis, and the drawing of conclusions on the basis of thorough analysis. The "Wetenschapsvisie 2025" jumps to conclusions, without any analysis, and this usually without knowing, or without investigating, the facts, or on the basis of a seemingly incorrect interpretation of these facts. A scholar who carefully reads the document will frequently pause to ask "Is that really true?" For example, is society more interested in science than ever (p. 9) and do people now know more about science? (p. 43). Is there indeed an international trend to more national programming of research? (p. 25). It is also easy to find factual statements that are simply false. It is clearly not true (as stated on p. 73) that only the number of publications determines the success of a scientific career. What matters is quality, not quantity. It is also telling that the "Vision" does not provide any interpretation of the data in the report "Motives of Researchers" that was sent to parliament along with it.

A document that misrepresents the facts and fails to provide a convincing analysis will not be taken seriously by scientists. In my view, it should also not be taken seriously by politicians and university administrators. The only explanation I can think of for misreporting facts and failing to provide analysis is that the conclusions were specified in advance: it was clear what should be established. However, this practice is unacceptable.

2. Top-down steering instead of bottom-up flourishing

The "Wetenschapsvisie 2025" aims to steer Dutch scientific research in a certain direction, essentially, with a more national focus and it being more demand-driven (rather than curiosity driven), with the demand coming from business and society at large. Now, of course, it is fine for the government to stimulate thinking and creativity, but steering in a certain direction is an altogether different matter. The "Wetenschapsvisie 2025" acknowledges that science is a search for the unknown (p. 9) and, hence, is unpredictable and that it is international developments that are determining the direction (p. 54). The more dynamic and the more international the environment, the more risky national steering becomes, especially for a small country like ours, hence, the less it should be attempted. In a situation like this, the government should have concluded that it should have limited itself to getting the framework conditions right, to contribute ideas, and to leave the rest to bottom–up initiatives and competition. The "Vision" stresses the need for flexibility, but at the same time it proposes rigid structures. The inconsistency is clear. It is a tunnel vision that has prevented the drafters to see it. On p. 9 they write that to allow Dutch science to flourish and to compete internationally, choices have to be made. I think this is misconceived: choices arise and they arise through a process of competition. The writers acknowledge that there is intense competition in research, but apparently they don't understand how it works, or they are not willing to accept it.

3. An almost exclusively national orientation

Although the "Vision" acknowledges that science is an international venture, its outlook is purely national. If one looks at the references, one notes that they almost exclusively are in Dutch, or are based on Dutch sources. The main insights were derived from a report of the Ministry of Finance and one from the AWTI (the Advisory Council for Science, Technology and Innovation). As if there is nothing to learn from abroad. As if we do not want to look at those places where the science system functions best. The only exceptions are references to EU or OECD documents, but these mainly focus on "research for competitiveness" rather than on curiosity driven research.

4. Selection Bias

The writers of the "Wetenschapsvisie 2025" seem to be unaware of selection bias. In several places, they note that they have broadly consulted with the Dutch scientific community. No doubt they will have, but still they have only had contact with a small sample, and this certainly is not a representative one. For example, many researchers in the Netherlands are non-Dutch, and many of these do not speak Dutch, so that it is unlikely that they will have participated. Recall that almost 50% of our PhD students are non-Dutch. Perhaps even more important, we know that the government frequently picks losers, and we also know why: the better researchers are less likely to participate in these consultations. Just as successful businesses have more profitable things to do than to lobby the government, so have top researchers better (and more interesting) things to do than to talk with administrators and government officials.[2] When one reads that "the national research agenda caters to a large demand" (p. 25) one notices that the accompanying footnote does not refer to academia and one wonders who in academia actually desires this. More generally, one wonders why there was not an open consultation of academics before writing this "Vision" document. The opening section of chapter 3 (p. 61) rightly puts researchers first, but the writers of the "Vision" have not really followed up on their own observation.

5. Inconsistencies

Inevitable, given the lack of analysis, the "Wetenschapsvisie 2025" is inconsistent. I already gave an example above. It is not difficult to find more. On p. 65 it is rightly noted that talent attracts talent. If one takes this seriously (and one better does), one also concludes that it is talent that will inspire others, and not administrative documents such as the "Nationale Wetenschapsagenda". It is persons rather than paper that will and can be used to profile Dutch science. The question should be who our most talented researchers are and how these can be facilitated as much as possible, not how we can restrict them and induce them to leave the country.

2 Richard Baldwin and Frederic Robert-Nicoud: "Entry and Asymmetric Lobbying: Why Governments Pick Losers", NBER WP 8756, 2002.

6. The minister of Economic Affairs as one of the authors

I find it quite remarkable that the "Wetenschapsvisie 2025", although a document of the Ministry of Science, Culture and Education, is sent to parliament, not only by the minister and state-secretary of that department of government, but also by the minister of Economic Affairs. It signals that culture, education and science are not viewed as being independent of the economy. Perhaps, this reflects the values of the current government, but I am not sure that this is in line with the values in Dutch society at large.

3. De Nederlandse Wetenschapsagenda

The most important proposal in the "Wetenschapsvisie 2025" is to come to a national research agenda, which will contain a list of priorities for scientists working in the Netherlands. There are two questions: (i) Why do we need such an agenda?; (ii) How will we get to it? The document discusses both, but does not give convincing answers.

The first argument that is given is that some other countries also have it. This is clearly a non–argument. One can as well state that some other countries spend a (much) larger percentage of GDP on science, hence, that the Netherlands should do that as well. It is worth noting that the world leaders in research do not have a national agenda, and that the countries that do have it have not evaluated whether having it is a good thing. Other arguments that are given in the "Wetenschapsvisie 2025" are that the agenda can be used to profile Dutch science, and that it can simplify cooperation between scientists, and between academic institutions and social partners. As indicated above, I believe there are much better ways to make quality visible. The agenda is also not needed to get cooperation between scientists. The "Vision" praises the cooperative attitude of Dutch researchers (p. 6). The largest drawback of national programming is that it reduces flexibility and prevents quick adjustment to changing circumstances, which, as the "Wetenschapsvisie 2025" argues, is essential (p. 19) and is an asset of the current Dutch system (p. 6).

A key question in all this is whether there are certain areas of science in which the Netherlands has as durable and, hence, strategic advance. If so, which areas are these? Clearly, this condition might hold for areas intimately connected to Dutch culture, or Dutch history, but even without an agenda it is clear that if one wants to study aspects that are specific to the Dutch society, one should first look here. Are there other areas or topics for which the Dutch have a strategic

advantage? My reading of the evidence is that peaks arise around individuals and that the landscape is dynamic and relatively unpredictable, as a result of positions being contestable. In situations like these, there is little that a national agenda can add, and much that it can prevent. In fact, the "Vision" shares my reading of the evidence (p. 18), but it draws a diametrically opposite conclusion.

Another role that the "Wetenschapsvisie 2025" sees for the national science agenda is to contribute to a more competitive economy and a more innovative business sector. That, possibly, could be the case. However, the desirability of such a narrower agenda (and of devoting a limited amount of research funds to it) should be discussed under "Industrial Policy" and not under "Science Policy". As rightly noted by a committee of the KNAW,[3] there are various roles that science plays, and the support of local business is only one of these. It may be fine for the government to support the R&D of business, but the main task of science is a different one. Policy making should be transparent and "Industrial Policy" should not be mixed up with "Science Policy". It is fine for the minister of Economic Affairs to be a co-author of a document of the first type, but he has nothing to do with the second.

4. Valorization and Demand-Driven Research

The second main proposal in the "Wetenschapsvisie 2025" is that valorization becomes the third main task of academics, in addition to research and teaching. It is not sufficient that researchers think about how the fruits of their research could possibly be put to societal use, it is proposed that NWO (and possibly others) will, in the future, also take into account realized valorization as a criterion for good research (p. 51). I think that this idea is misconceived and that science history clearly shows it to be wrong; also see (KNAW (2013). The science vision includes the strong (but nevertheless incorrect) statement that knowledge only gets societal value if it is shared and applied in specific solutions or proposals (p. 39).

Strongly related to this is the third main proposal, which is that we move to a more open science in which there is co-creation of knowledge from the demand side. The "Wetenschapsvisie 2025" strongly advocates the idea of such co-creation, not only with business and government agencies, but also with societal actors and even individual citizens. I conclude from this that the

[3] KNAW (2013), *Publieke kennisinvesteringen en de waarde van wetenschap*, https://www.knaw.nl/nl/actueel/publicaties/publieke-kennisinvesteringen-en-de-waarde-van-wetenschap

writers of the "Vision" have a very romantic view on science. On the basis of my own experience with various ministries and government agencies, I also conclude that the writers strongly overestimate the absorptive capacity of the demand side.

The "Wetenschapsvisie 2025" proposes that interested parties will not only play a part as co-creators, but that they will also influence the development of science through the national research agenda. The idea is that the demand side will articulate what it wants and steer the agenda in this way. According to the "Vision", this will lead science to focus on the most important societal questions (p. 46) and to improvement in our competitive position (pp. 48, 50). Of course, the "top sector policy" will be continued as this has brought a new dynamic to the Dutch economy (p. 51). The latter is stated bluntly, but, of course, no evidence whatsoever is provided, not even a reference to a serious evaluation of this policy.

Given that the writers themselves state that they have no information about how our science system is functioning (p. 57), it seems to me that they must have been day-dreaming when writing these passages. It is correct, as they write on p. 48, that we should think about the ecosystem as a whole, and it may definitely be useful to get to better knowledge utilization. However, if it is a system, then one should not look at one element of it in isolation; one should not point to the supply side alone. In my personal interaction with various government ministries and other agencies, I have noticed that at least this part of the demand–side finds it very difficult (or even impossible) to articulate its demand (p. 54), and that the absorptive capacity of some of these organizations has become much smaller in the last 25 years. I also note that many firms have outsourced research and have, thereby, also reduced their absorptive capacity. If anything, the gap between the supply and demand for research has increased, and it should at least be addressed how a better knowledge utilization should be achieved: by forcing science to lower itself, or by asking government agencies to rise above their current level.

5. Producing, Preserving and Attracting Talent

The final chapter of the "Wetenschapsvisie 2025" deals with the scientists as such, clearly the most important factor in the system. The chapter rightly stresses the intrinsic motivation of the individual researchers and the absolute desire to perform (p. 61). Unfortunately, immediately thereafter, the "Vision" concludes that currently researchers are mostly rewarded and appreciated for scientific publications (p. 62), suggesting that that would be the wrong thing to

do. It is as if a soccer team should be rewarded also for the beauty of its outfit rather than just for the number of goals that it scores. I do not doubt that the current system can be improved at the margin, and I would encourage such improvements, but to state that its core should be changed, as is done in this final chapter, and then without any analysis, is going much too far. Researchers desire to contribute to our understanding and a scientific publication is an acknowledgement that such a contribution might have been made.[4] These are the medals that scientists strive for. Tinkering with this may undermine the entire system.

In my view, this entire final chapter shows little understanding of how academia works and is completely misconceived. For example, on p. 63, it is stated that other career perspectives (other than research) should be opened, but clearly such paths are already available now. No doubt, it is very desirable that some good academics become administrators or Rectors, but the only door to that, in my view, should be by means of a PhD followed by an initial stage in which an ability to be successful in research is shown, that is, a demonstration that one is curious, creative, critical and disciplined. Page 62 notes that currently already two-thirds of those that complete a PhD end up outside university, and concludes from that that the PhD-phase should be changed to better prepare for outside jobs. My reading of the data is exactly the opposite: apparently, the PhD already prepares very well for a job outside of the university. The skills that one learns, to be critical and disciplined, are indeed very valuable and, perhaps, also difficult to learn in other environments than academia.

Already in the Introduction, the "Wetenschapsvisie 2025" shows a complete misunderstanding of how academia works, at least in the part of it that I am familiar with. It is stated there (p. 10) that academia offers one-sided career perspectives and that this limits valorization, and that certain groups of scientists are excluded because they do not excel at the existing indicators. Nothing could be more wrong than the idea that only indicators count. Similarly, the idea that a good research group would want to limit the creativity of its researchers is wrong. The point is that the only thing that counts is scientific quality, that is, the combination of creativity and discipline. The point is also that quality is difficult for outsiders to see, which is why the indicators exist: they allow administrators (and the government) to allocate money and steer in certain directions. However, these indicators are very imperfect and, therefore, they should be used with restraint, hence, the importance of autonomy. The important decisions should be left

[4] It is noteworthy that 40% of the researchers sampled in "Drijfveren van onderzoekers" (Rathenau Instituut, 2014) considers it important to do research that is societal relevant.

as much as possible to scientists as they are the only ones that can verify true quality. The final, but perhaps most important point of all is that true talent is really scarce, hence, that competition for attracting and developing talent is very fierce. Research groups compete to attract that talent and they clearly have every incentive to do so. They will screen carefully and the only reason why they will exclude people is because these lack quality, not because they do not well on the indicators. These considerations also have important consequences with respect to the role of NWO. Incentives to make a good selection are lower at that level, hence, NWO better be a follower and enabler in the system, rather than an actor that is at the steering wheel.[5]

The general weakness of the "Wetenschapsvisie 2025" shows most clearly in its final chapter. The writers have the idea, or preconception, that something is wrong and they point their finger to science. It would, however, have been wise to first look more closely at how the system really works, and, secondly, also look at the other elements in the scientific eco-system. Academia currently is charged with certain tasks and there is no other institution doing these. As acknowledged in the "Wetenschapsvisie 2025", it is doing these tasks reasonably well. Agreed, things, such as knowledge utilization or reporting about science, could be better,[6] but these things could also be picked up by other actors; it is the weakest link of the system that determines the outcome. Improving the system overall while allowing science to focus on what it can do best seems to be the best way to proceed.

6. Conclusion

Good science deserves a better science policy.

[5] Along with the "Wetenschapsvisie 2025", a document on NWO was sent to parliament, "Van lappendeken naar een nationaal discours en centrale programmering" http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2014/11/25/van-lappendeken-naar-een-nationaal-discours-en-centrale-programmering.html From the title, I conclude that also this document proposes programming and steering instead of competition. I have not looked at this document, and will not; core business is giving an urgent call.

[6] Other things can be mentioned. Figure 2.1 in "Drijfveren van onderzoekers" shows that professors (the best paid researchers) on average spend less than 1 day per week on research (and 1 day per week on research supervision). This allocation of time seems inefficient.