

Open Science Monitor

Results exploratory **open science** survey

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dialogic

In collaboration with:



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1. Introduction and survey design

The aim of the survey was to assess Dutch researchers' **familiarity with open science practices, the extent to which these practices are used, and the importance researchers attribute to them**. The survey was **exploratory in nature** and was explicitly designed to provide an initial overview of the current state of knowledge of and engagement with open science practices across the Dutch research landscape.

In this survey, UNESCO's definition of open science was used, including its four key 'pillars' of open science: **open scientific knowledge, open science infrastructures, open engagement of societal actors** and **open dialogue with other knowledge systems**. Per pillar, respondents were asked:

1. If they are familiar with practices linked to the pillar;
2. If they use these practices in their work;
3. If they consider these practices valuable for the whole of Dutch academia;
4. Which of the proposed practices they consider most important to monitor.

The survey design was based on the [UU open science survey](#). The four questions above were asked as closed questions, followed by an open answer field to provide space to explain or elaborate on answers. For all practices that were described, a definition was provided.

The survey was part of broader research in preparation for the development of a **Dutch open science monitor***. In addition to this survey, community consultations were conducted (interviews: n=20; focus groups: n=12). Where relevant, the results of the community consultations are triangulated with results of the survey in this document.

*One of the missions of [OS NL](#) is to create a monitor on open science in the Netherlands. For this initiative, [CWTS](#) and [Dialogic](#) have been enlisted to research and determine what should be included in the monitor, and how a minimal viable product can be designed.

The research in preparation of the development of the monitor included desk research about the open science policy landscape, community consultations (such as interviews and focus groups) and a survey, of which the results are presented in this document.

2. Method

The survey was targeted at **all Dutch scientists**. For this survey, the population of all Dutch scientists was defined as *all researchers employed by Dutch universities, UMCs, NWO-i or KNAW institutes*.

To reach this population, the following method was used:

- Email addresses of scientists were collected through **web scraping** from organizational websites, along with the scientist's job position and department. This resulted in a grand total of **N=51,519 unique email addresses** of Dutch scientists.
- We sampled 40% of the grand total (~20,000 email addresses), stratified by institute and function. We sampled the email addresses without replacement (i.e., nobody ended up in multiple batches).
- The stratum sample size was **rounded up** to the nearest integer, based on the original size (in the initial web scraping sample), until the stratum was exhausted.
- We allowed further sampling with oversampling based on **institute** and **function**.
 - Relative weights were used to determine the amount of oversampling.
 - Due to small stratum sizes the sample sizes were once more rounded up to the nearest integer.
- The job positions were recoded to exclude irrelevant functions. The following function groups were kept:
 - Associate professor (UHD)
 - PhD
 - Postdoc
 - Assistant professor (UD)
 - Professor (hoogleraar)
 - Researcher (rest category)
 - Lecturer (docent)
 - IT/data/research support
 - Management

The survey was finally sent out to **N=20,182** Dutch scientists from different institutes. On the next page, the method is illustrated schematically. Appendices I and II provide an overview of the initial web scraping and stratified sample.

Step 1



Initial web scraping:
N=51,519
unique email addresses

Step 2



Stratified sample
N=20,182
unique email addresses



Got survey invitation

Step 3



Respondents
N=981
Scientists



Completed survey

Field of research	Amount of respondents
Natural Sciences (ENW)	466
Social Sciences and Humanities (SSH)	217
Applied and Engineering Sciences (AES)	145
Life Sciences (ZonMW)	103
Other	32
Missing data	18

Job position	Amount of respondents
Assistant professor (UD)	226
PhD	206
Professor (hoogleraar)	172
Associate professor (UHD)	125
Postdoc	87
Researcher (other categories)	43
Lecturer (docent)	35
IT/Data/Research support	25
Management	18
Other	44

Results

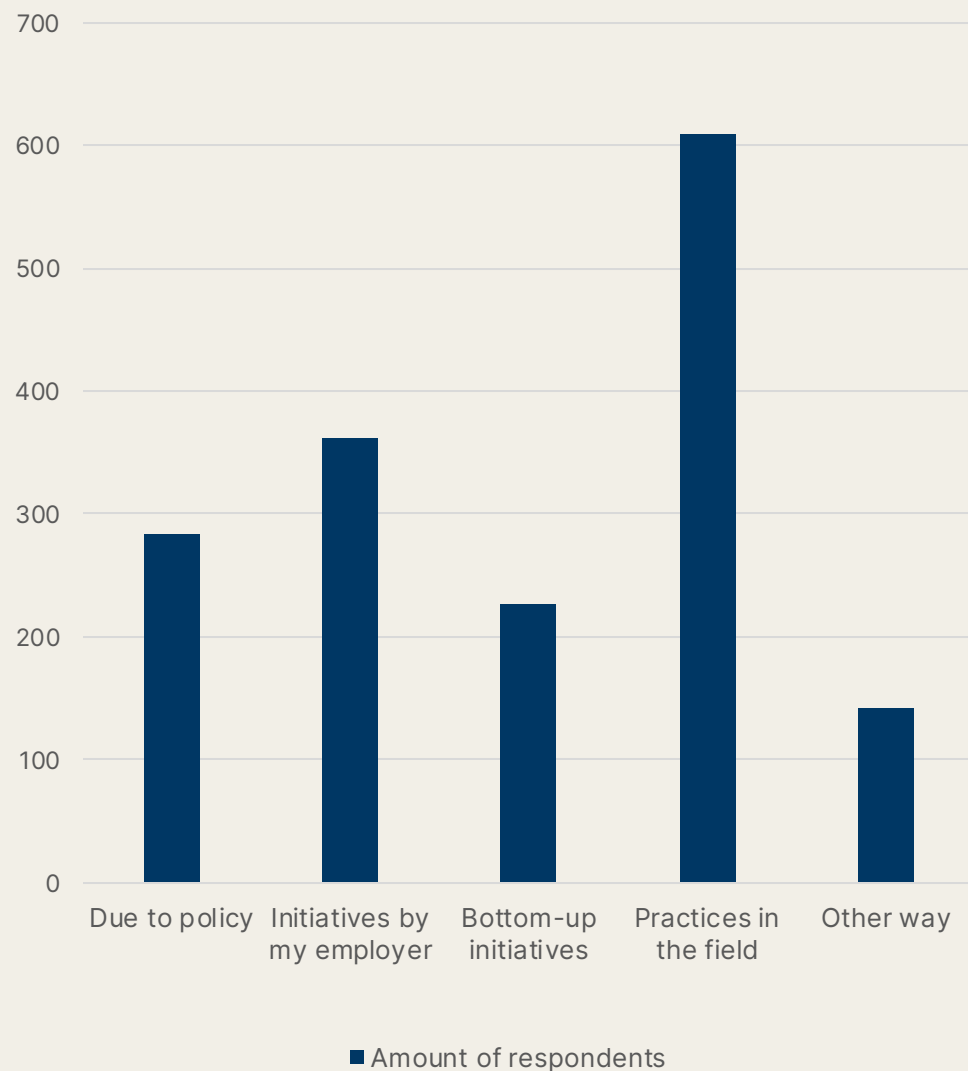
3. Characteristics of respondents

- The survey was sent out to 20,182 scientists.
- 1803 scientists started the survey (response rate 9,0%)
- **981 scientists completed the survey (response rate 4,9%)**

In Appendix III, we provide an estimated distribution of respondents across institutions and positions based on the web-scraping data. Because survey IDs were anonymized, it was not possible to link institutions and job positions from the web scrape to individual survey IDs directly. However, we could estimate the respondents' institutions. Estimates of job positions were not needed for our analyses, as job position was also captured through a survey question (self-reported by respondents).

The survey also asked respondents to report their field of research, job position, and gender. In total, 55% of respondents were male, 39% were female, and 6% indicated something else. The tables on the left show respondents' fields of research and job positions.

The job positions of respondents in the sample generally reflect the initial web scraping population. The biggest differences were found in the groups UD (23% of initial web scraping, 11% of respondents in sample) and professor (10% of initial web scraping, 18% of respondents in sample).



Results

4. How did respondents become familiar with open science?

The diagram on the left shows how respondents became familiar with open science. When they selected 'other way', the following explanations were given:

- Most respondents became familiar with open science through **education, courses, PhD/research training**, or university teaching.
- Many learned through **colleagues, supervisors, research groups, conferences, and academic networks**.
- A recurring route is through **work roles**: policy advisor, data steward, librarian, research support, or involvement in open science projects.
- Some mention **funders, NWO/EU requirements, accreditation, or institutional policy**.
- Others learned via **personal interest**, online reading, social media/Twitter, MOOCs, or the replication crisis.
- Several respondents say they are **not familiar**, only vaguely aware, or encountered it mainly through this survey or the invitation email of the survey.

Results

5. Open scientific knowledge (1)

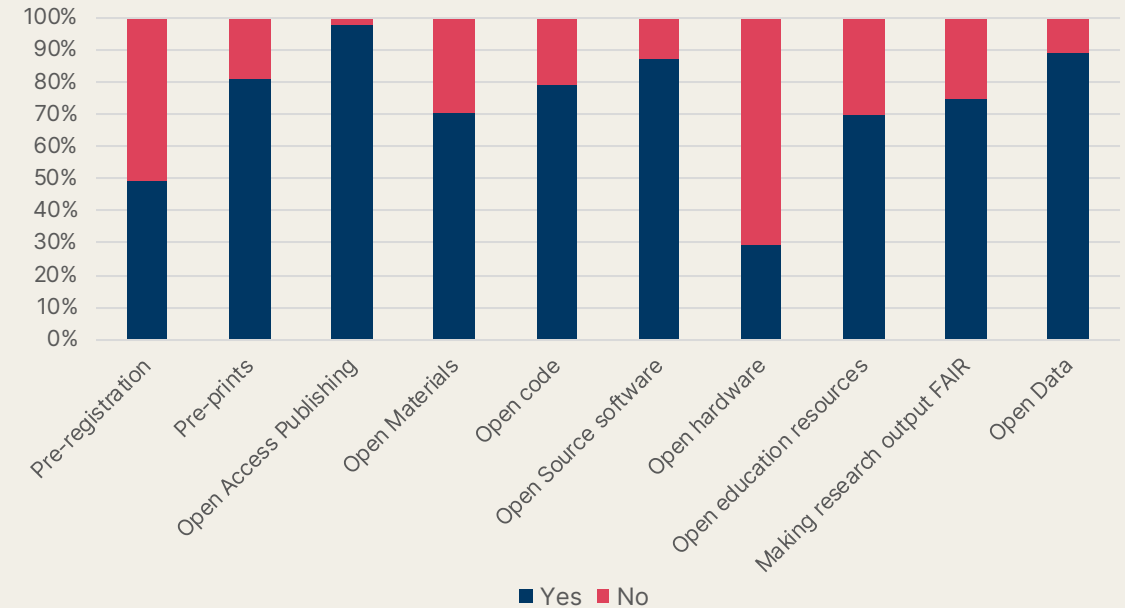
NB: The top diagram includes all respondents. The bottom diagram includes for each practice (bar) the respondents who indicated that they were aware of the practice in question.

- **Open Access is the most well-known** and most used practice (by respondents who were aware of the practice).
- **Open hardware is the least-known** and least used practice (by respondents who were aware of the practice). **Pre-registration is also relatively unknown** and not used much.
- For the other practices, 70% of respondents or more know them. Of the people who are aware of a practice, between 56% and 76% (strongly) agree that they frequently use the practice in their work.

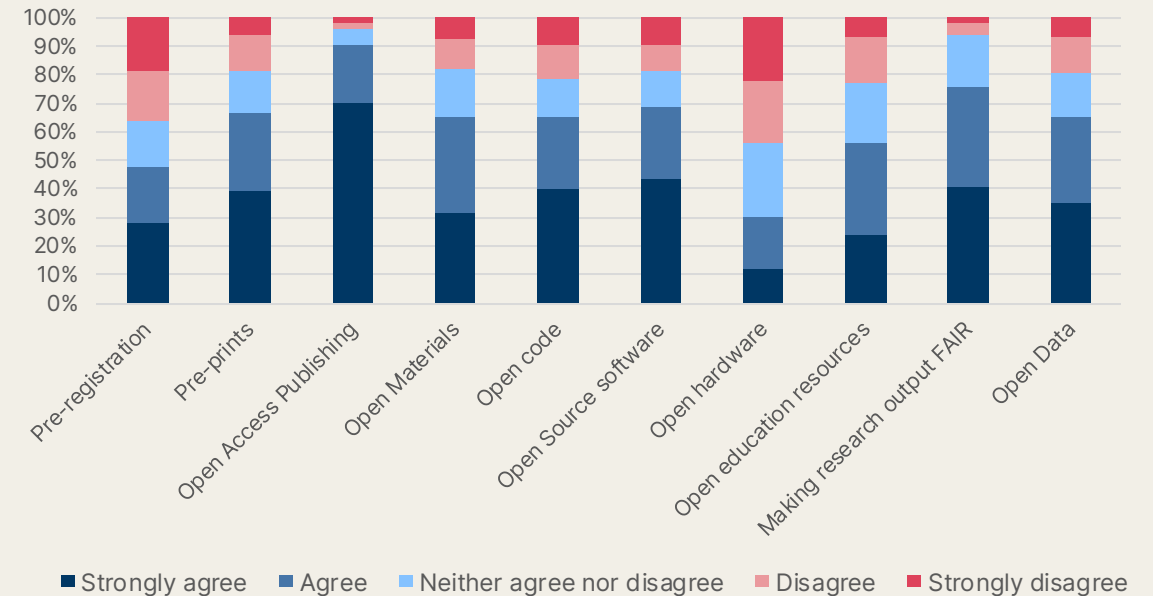
The results are in line with what was expected. In literature and community consultations it is apparent that open access publishing was the most known and used practice of the open scientific knowledge theme.

Respondents elaborated on their answers in an open field. The key concerns of open scientific knowledge that were mentioned are privacy/GDPR, sensitive qualitative or clinical data, (lack of) commercial sensitivity, APC/publisher costs, predatory journals, copyright/IP, and AI/LLM reuse.

Are you aware of the following practices



I frequently use this practice in my work



Results

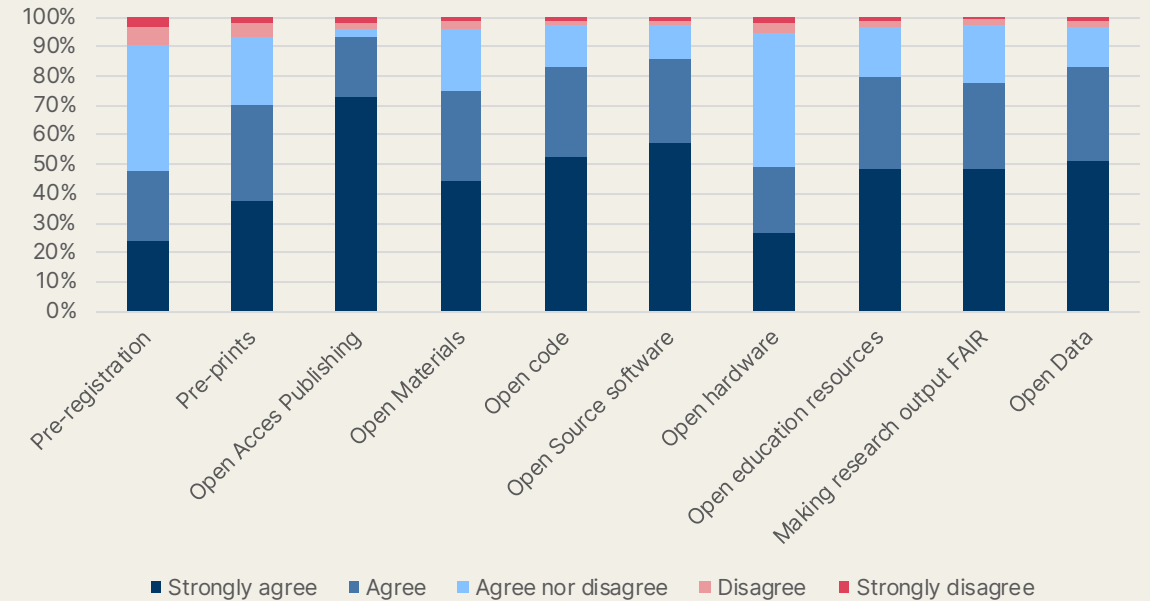
5. Open scientific knowledge (2)

- Generally, **respondents considered practices of open scientific knowledge important** for the whole of Dutch academia. For most practices, between 70% and 93% agree or strongly agree that the practice is valuable. The two exceptions are pre-registration and open hardware, of which less than 50% of the respondents (strongly) agreed that the practice is valuable for the whole of Dutch academia.
- Open access was most often chosen for the top 3 most important practices**, followed by open materials. Open educational resources was least chosen as the most important practice.

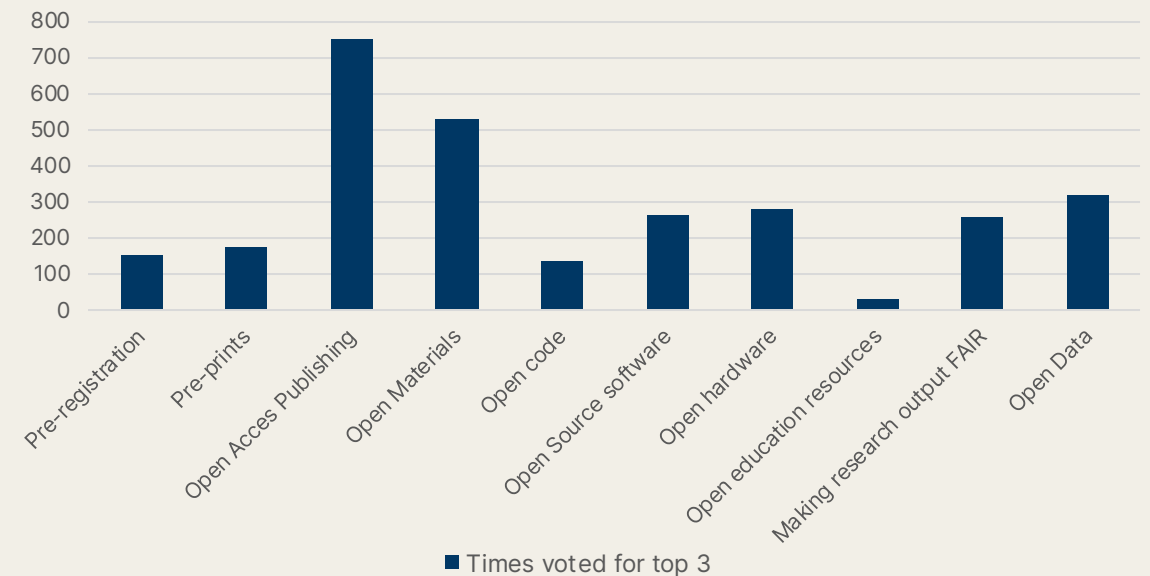
As elaboration on their answers, most respondents mentioned that they strongly support open science as being essential for publicly funded science. On the other hand, some respondents were critical of open science. Reasons for these critical views were for example that they thought open science may **add bureaucracy**.

Overall, respondents stress that open science should be **discipline-specific**, since not all practices (as described in the figures on the right) fit every discipline. Examples that were mentioned for which practices such as open data may be more difficult to implement, were fields that use sensitive data (e.g. humanities or healthcare) or commercially sensitive research.

I consider this practice valuable for the Whole of Dutch Academia



Top 3 most important practices



Results

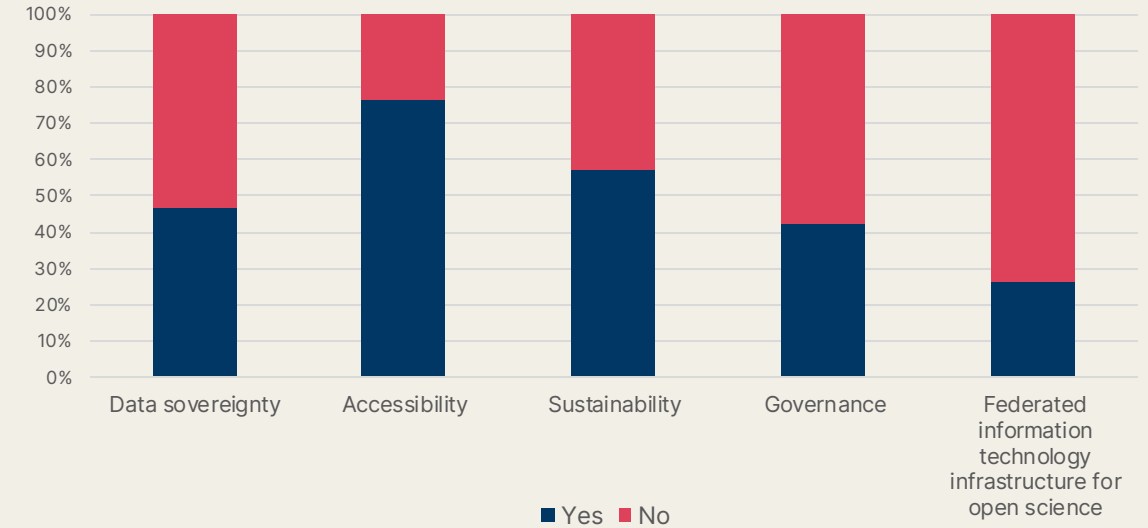
6. Open science infrastructures (1)

NB: The top diagram includes all respondents. The bottom diagram includes for each practice (bar) only the respondents who indicated that they were aware of the practice in question.

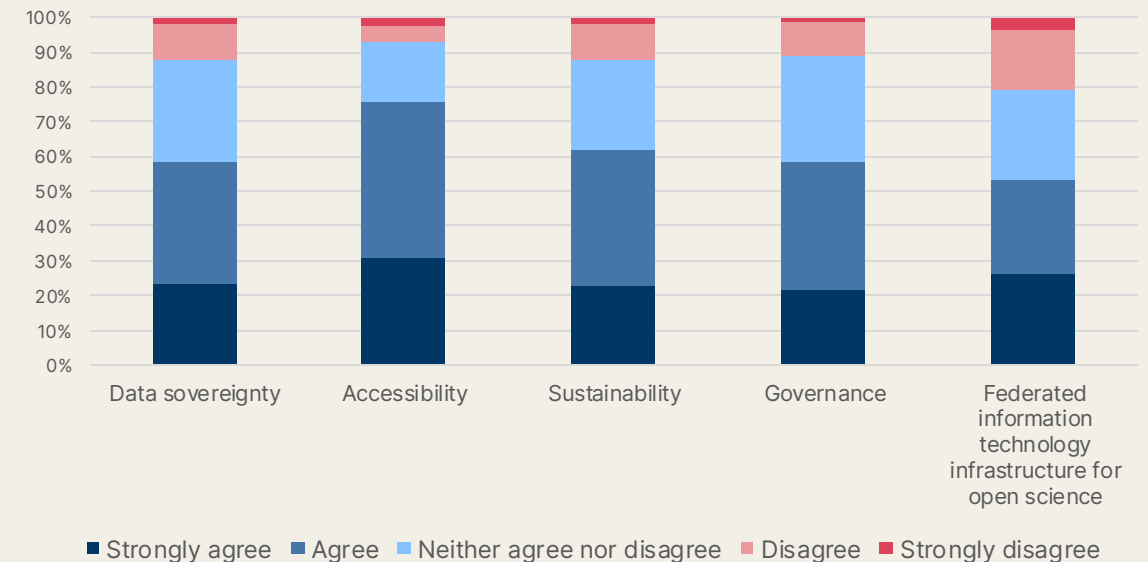
- **Accessibility** is the most well-known practice of open science infrastructures.
- Compared to open scientific knowledge practices, **respondents are less familiar with practices** regarding open science infrastructures.
- Out of the respondents who were aware of the practices, the majority (strongly) agrees that they frequently use the practice in their work.

Open science infrastructures were generally discussed in the community consultations as an objective still to be developed, rather than as something already in place; they were framed as a **future-oriented** concept. Researchers often noted that current open science practices lack this kind of infrastructure. The survey findings align with these observations.

Are you aware of the following practices



I frequently use this in my work



Results

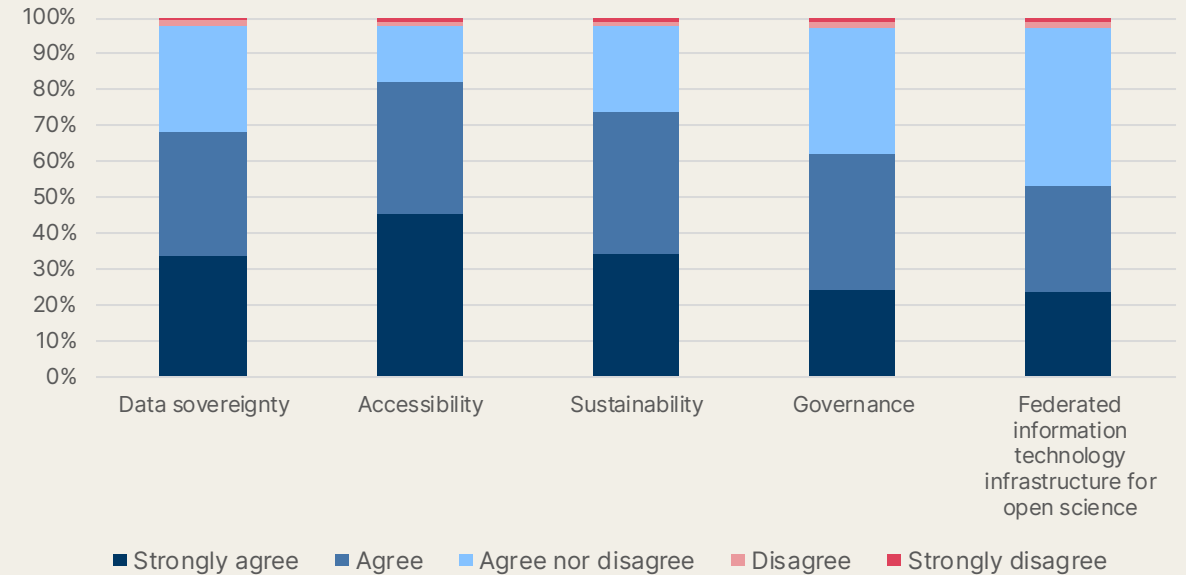
6. Open science infrastructures (2)

- The majority of respondents (strongly) agreed that the practices linked to open science infrastructures are valuable for the whole of Dutch academia.
- Accessibility** was considered the most valuable and important practice. This is understandable, as it is also the best-known practice.

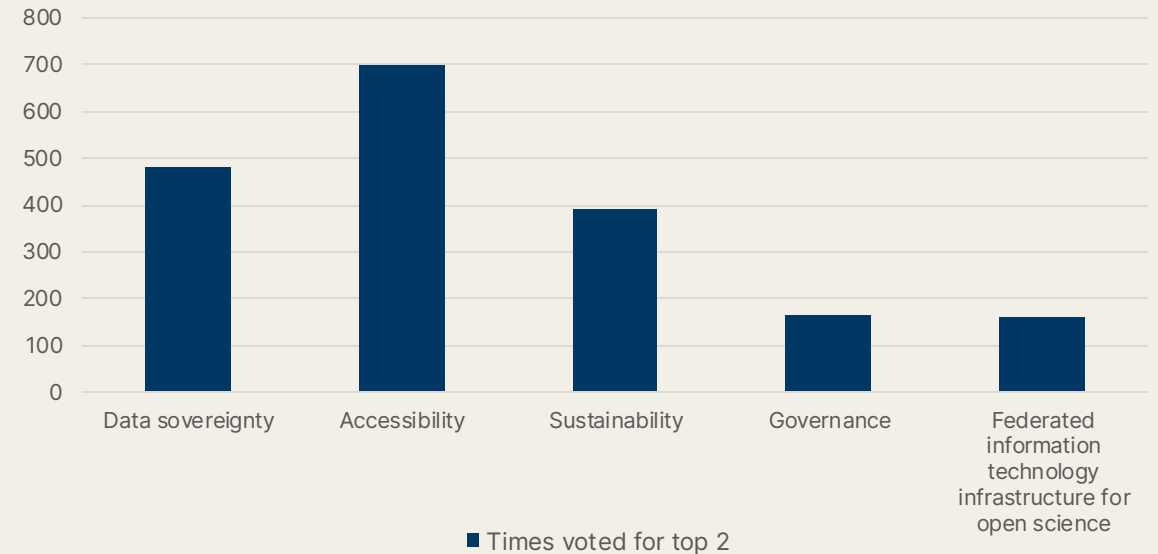
In the open answer field, some respondents explained that knowledge security and data sovereignty become increasingly important in today's **geopolitical climate**. They also expressed concern about the growing dependence on big tech platforms within (digital) infrastructures for science.

In addition, respondents mentioned that (short term) grant-based **funding can have a negative impact on open science infrastructures**, as it is often unsustainable: once funding ends, maintenance and continuity often stop as well.

I consider this practice valuable for the Whole of Dutch Academia



Top 2 most important practices



Results

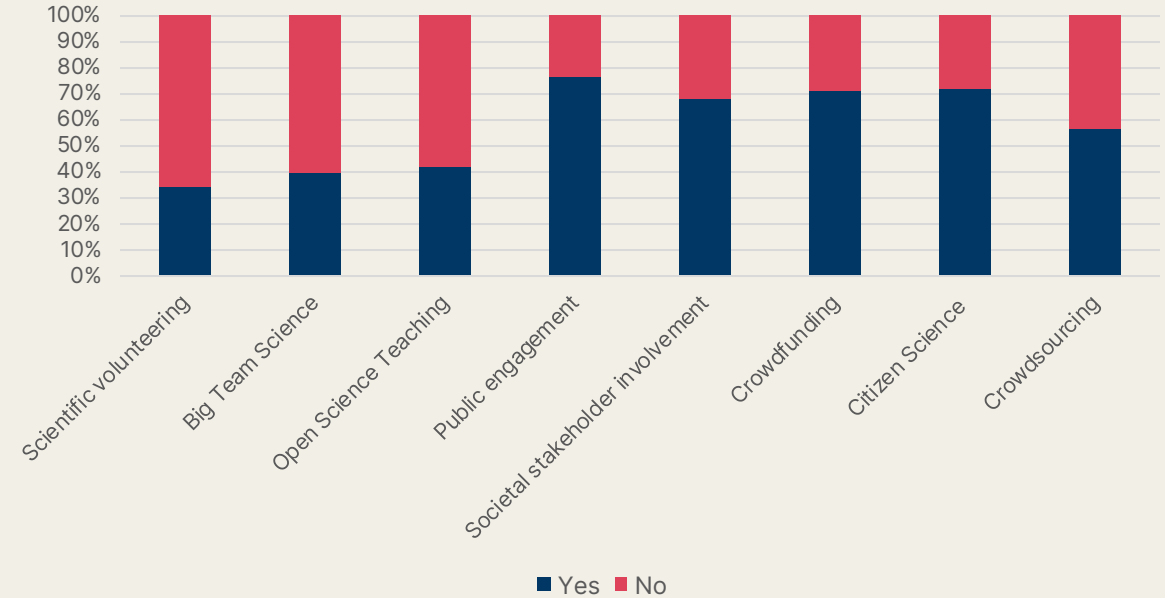
7. Open engagement of societal actors (1)

NB: The top diagram includes all respondents. The bottom diagram includes for each practice (bar) only the respondents who indicated that they were aware of the practice in question.

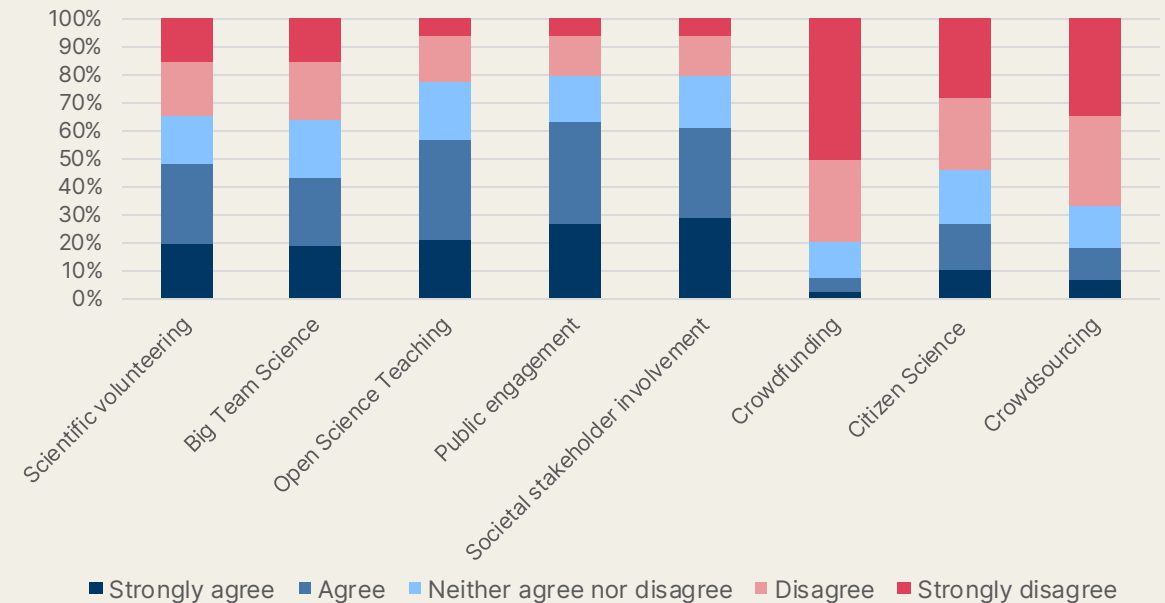
- **Public engagement** and **societal stakeholder involvement** are the **best-known practices** of open engagement of societal actors. Out of the respondents that were aware of these practices, more than 60% (strongly) agreed to frequently use the practices in their work.
- The **minority** of the respondents were aware of **scientific volunteering, big team science and open science teaching**.
- **Crowdfunding, citizen science and crowdsourcing** are **practices that are well-known, but not used frequently**. Less than one third of the respondents who were aware of these practices, use them.

An explanation for not making use of citizen science from the community consultations, is that some people framed citizen science as **time-consuming** and not suited to every research trajectory (e.g. fundamental research). Additionally, it was mentioned in both survey answers and the community consultations that involvement of citizens/society should be **field-specific**. Some added that citizen science, crowdfunding, or public input should not be forced in research where it is not relevant.

Are you aware of the following practices



I frequently use this practice in my work

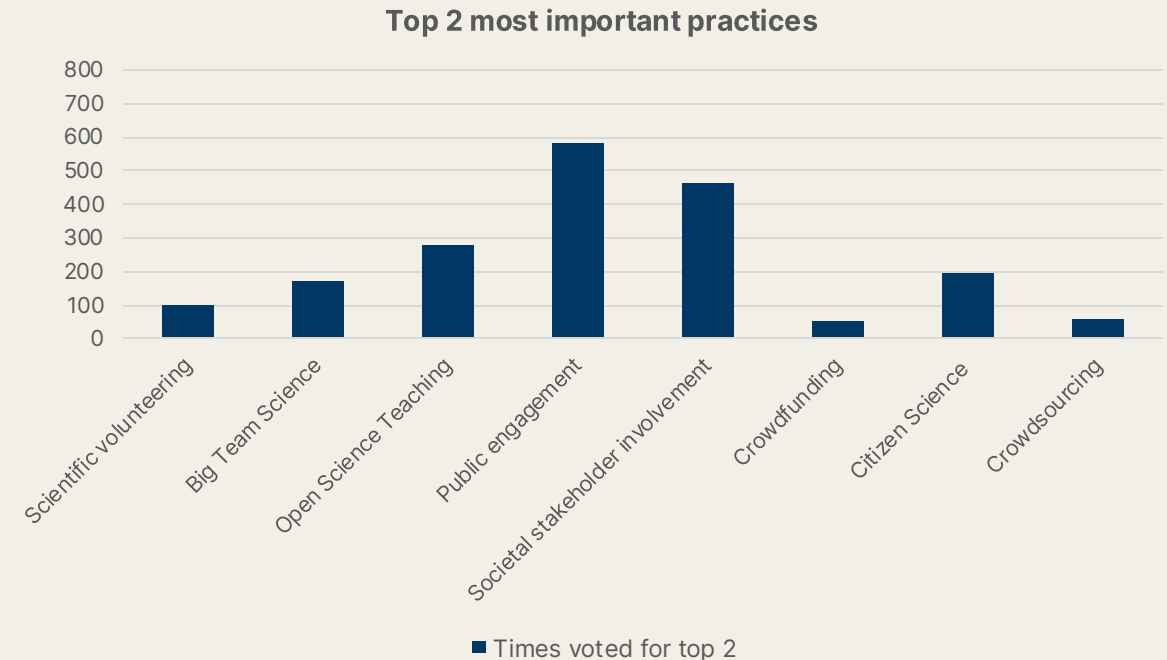
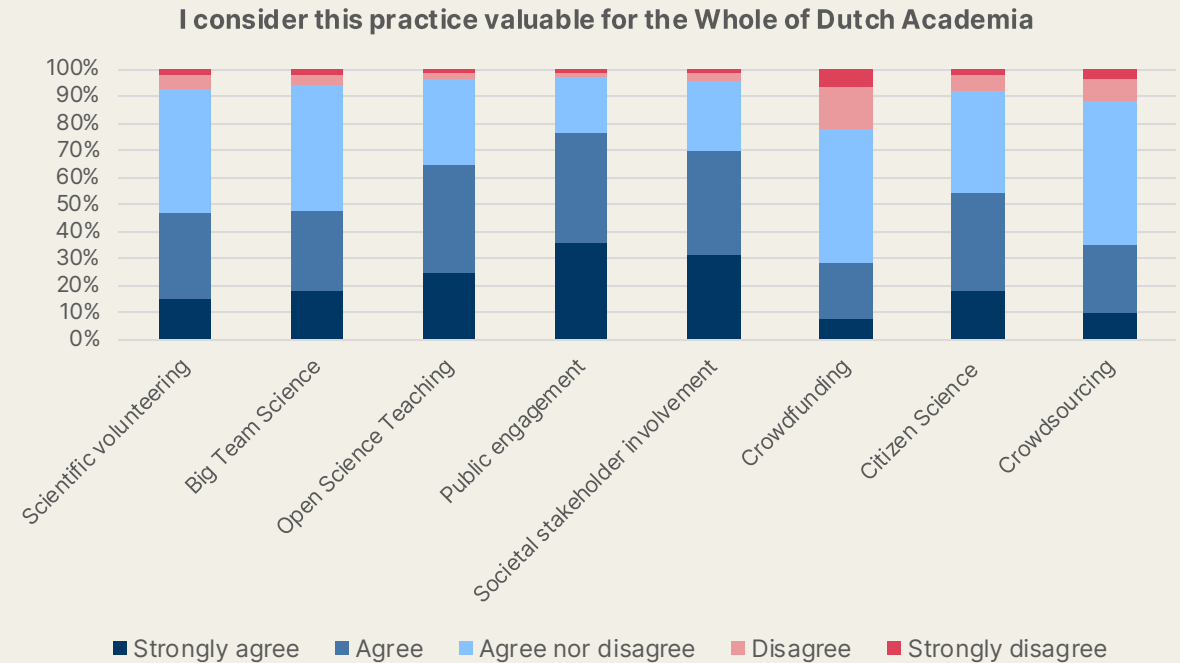


Results

7. Open engagement of societal actors (2)

- More than two-thirds of the respondents (strongly) agreed that **open science teaching, public engagement and societal stakeholder involvement are valuable** for the whole of Dutch academia. Additionally, they were chosen most often in the top three most important practices. This is logical, since these practices are also the most well-known and most used.
- **Crowdfunding and crowdsourcing were considered least valuable** for Dutch academia, with respectively 28% and 35% of the respondents (strongly) agreeing that these practices are valuable.

In the open survey answers, respondents highlighted opportunities of societal engagement, as well as threats. Respondents mentioned that engagement is important for **public trust, societal impact, transparency, science communication, and taxpayer accountability**. Concerns that were mentioned are **extra workload** for researchers, **politicization of science**, misuse of **unpaid volunteering**, and stakeholder **power imbalances**.



Results

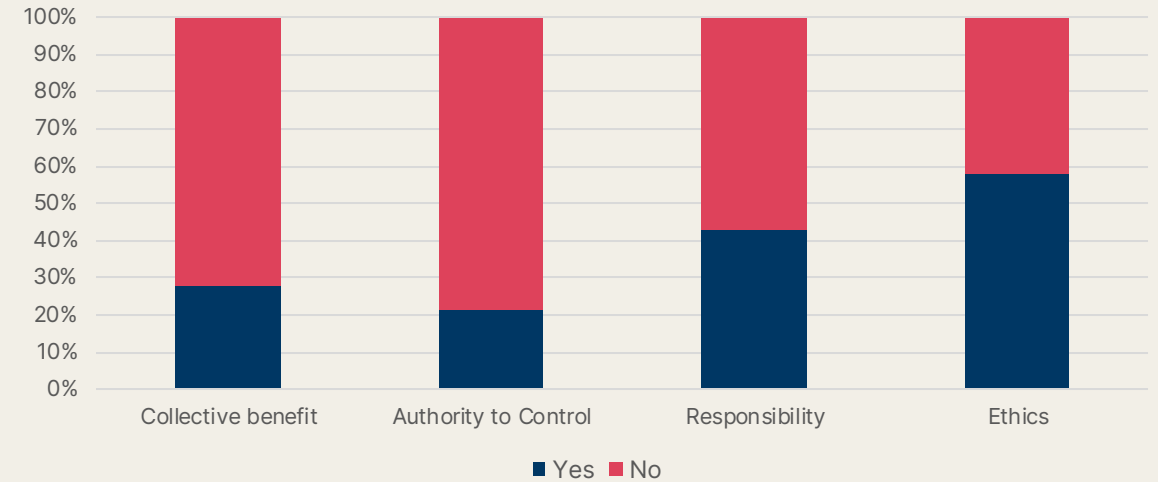
8. Open dialogue with other knowledge systems (1)

NB: The top diagram includes all respondents. The bottom diagram includes for each practice (bar) only the respondents who indicated that they were aware of the practice in question.

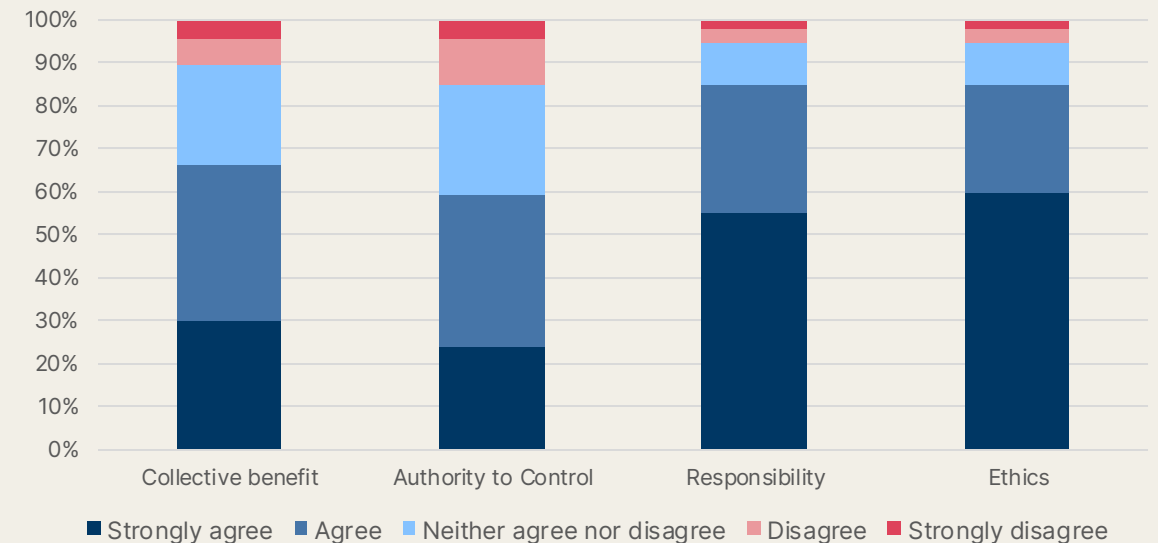
- Compared to the other UNESCO pillars, respondents are least aware of practices related to open dialogue with other knowledge systems.
- The survey results show that the **majority of respondents is aware of ethics. Less than half of the respondents is aware of the practices collective benefit, authority to control and responsibility.**
- The majority of the respondents who were familiar with the practices indicated that they frequently use the practices in their work.

The UNESCO framework uses terminology for these practices that form the acronym CARE. In the community consultations, researchers and stakeholders indicated that they **did not know this acronym but were familiar with the practices**. Often, they were part of their institution's code of conduct, research guidelines or research integrity code.

Are you aware of the following practices



I frequently use this practice in my work



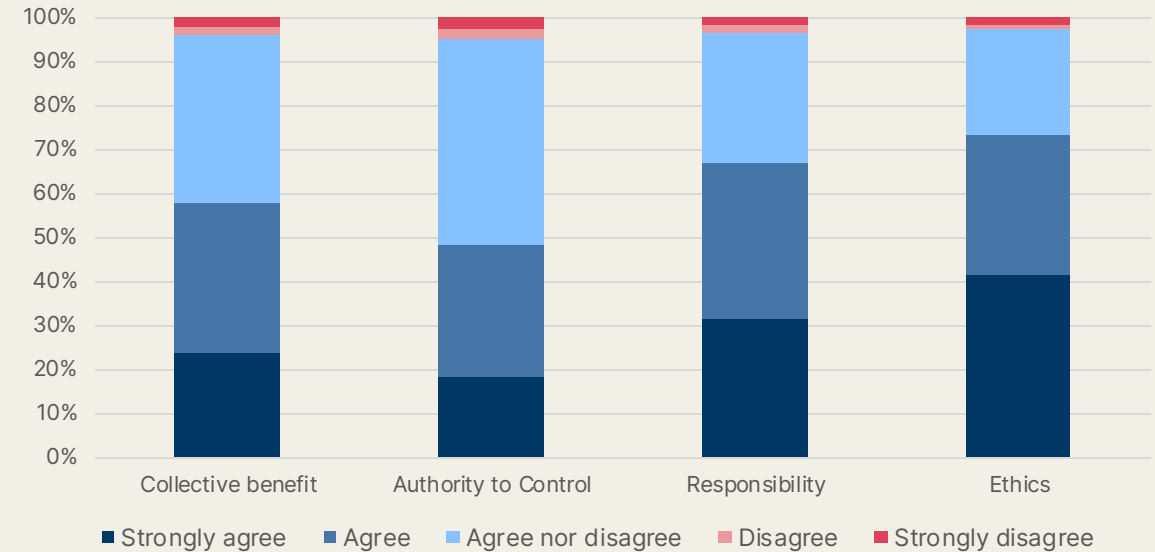
Results

8. Open dialogue with other knowledge systems (2)

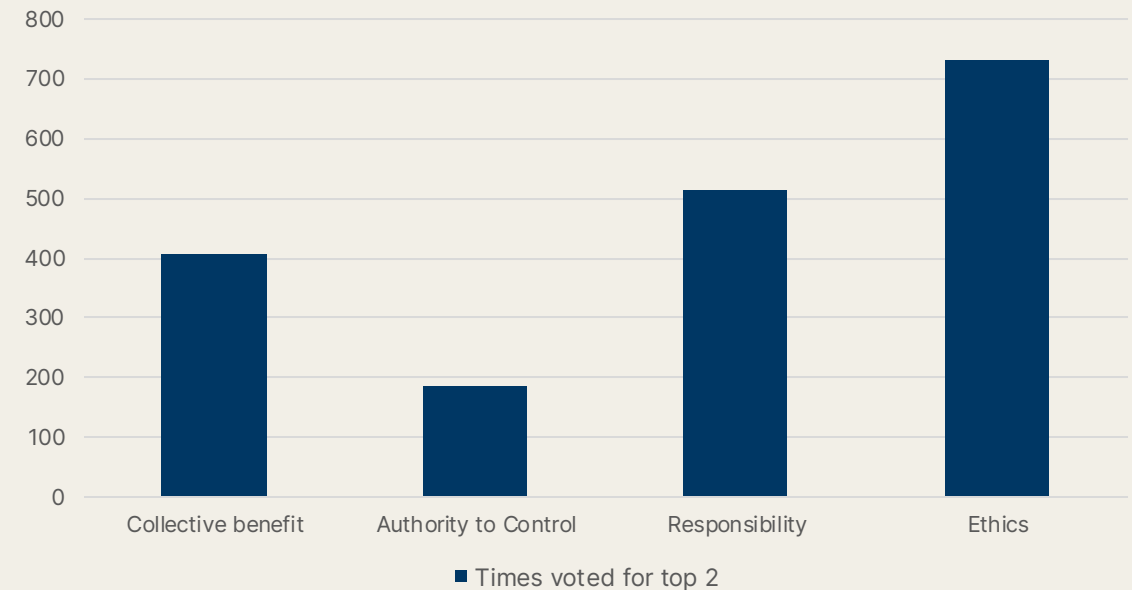
- Overall, **most respondents consider the practices related to open dialogue with other knowledge systems valuable** for the whole of Dutch academia.
- Only for the practice **authority to control**, **less than 50% (strongly) agrees that the practice is valuable** for the whole of Dutch academia. This practice was also the least chosen in the top 2 most important practices (within this pillar).

In the open answers, respondents mention that **ethics and responsibility** are essential for trustworthy, respectful research. Some respondents emphasize the importance of collective benefit, especially for **marginalized or Indigenous communities**. Several say the topics are **not relevant to their field** or already covered by existing ethics procedures.

I consider this practice valuable for the Whole of Dutch Academia



Top 2 most important practices



9. Conclusion

Across the four pillars, respondents are generally aware of open science practices and value open science. Most scientists who are aware of an open science practice use the practice in their work.

- **Respondents are most aware of practices related to the pillar open scientific knowledge.** Open access is the best-known and most used practice. It is also considered the most important practice overall. Most respondents who are aware of open scientific knowledge practices, also use them (frequently) in their work. Generally, the majority of respondents considers all practices within this pillar valuable for Dutch academia.
- In the pillar open science infrastructures, respondents mainly indicate to be aware of accessibility of science. However, **most respondents consider all practices within open science infrastructures valuable.** Of the respondents who are aware of the practices in this pillar, the majority uses them in their work.
- Regarding open engagement of societal actors, public engagement and citizen science are best-known. In contrast to open scientific knowledge, **many respondents who are aware of the practices related to open engagement of societal actors, do not use them in practice.** Generally, the practices are also considered a bit less valuable for Dutch academia as a whole than practices in the first two pillars.
- Lastly, **respondents appear to be the least aware of practices related to open dialogue with other knowledge systems.** Respondents who are aware of these practices do indicate to use them in their work. In addition, most respondents consider the practices valuable, especially ethics and responsibility.

Appendices

dialogic

Appendix I: initial webscraping (without duplicates, N=51,519)

Institute	Lecturer (Docent)	Professor (Hoogleraar)	IT/data/ research support	Manage- ment	Not collected	Researcher	PhD	Postdoc	UD	UHD	(blank)	Grand Total
AMOLF			26	1		20	84	37				168
ASTRON			7	2		12	39	21				81
CWI		2	6	1		122	101	6				238
DANS			27	9		10						46
DIFFER					52							52
Erasmus Universiteit Rotterdam	326	375		1	1	537	1231		331	269		3071
Herseninstituut			26	16			82	58				182
HFML-Felix			9	2		6	14	3		1		35
Hubrecht			38			25	92	55				210
Huygens			7	10	1	41	7	5				71
IISG			16	7		56	12	8	1			100
KITLV						13	19	9				41
Maastricht University	112	249	1	12	2	119	221	4	285	183		1188
Meertens			1	4		27	4	7				43
NIDI				1	1	1						3
Nikhef					428							428
NIOD		2	13	7		29	12			1		64
NIOO-KNAW			4	3		36	24	9				76
NIOZ			23	15	7	91	73	41				250
NSCR			3	5		42	37	10				97
Open Universiteit	28	72	7	12	911	10	46	8	101	21		1216
Practoraten					115							115
Radbout Universiteit Nijmegen	372	690	128	169	191	292	1404	159	488	229		4122
Rijksuniversiteit Groningen	225	723	39	65	624	183	766	153	591	310		3679
Technische Universiteit Delft					7175							7175
Technische Universiteit Eindhoven	48	301	14	43	89	262	378	132	340	207		1814
Tilburg University	190	292	1	16		277	658	22	374	173		2003
UMC Groningen	3	70	48	30	9	118	339	67	24	23		731
UMC Utrecht		227				69	152	62	321	155		986
Universiteit Leiden	246	796	11	15	22	354	1178	29	606	239		3496
Universiteit Twente	221	306	61	228	56	649	1514	31	458	222		3746
Universiteit Utrecht	259	663	187	486	184	728	874	5	1041	440		4867
Universiteit van Amsterdam											6831	6831
Universiteit voor Humanistiek	5	25			7	7	83		28	6		161
Vrije Universiteit Amsterdam	668	561				723	1211		632	331		4126
Westerdijk						7						7
Grand Total	2703	5354	703	1160	9875	4866	10655	941	5621	2810	6831	51519

Appendix II: stratified sample (without duplicates, N=20,182)

Institute	Lecturer (Docent)	Professor (Hoogleraar)	IT/data/ research support	Management	Not collected	Researcher	PhD	Postdoc	UD	UHD	Grand total
AMOLF			10			8	34	16			68
ASTRON			4	2		6	16	8			36
CWI		2	2			48	40	2			94
DANS			12	4		4					20
DIFFER					20						20
Erasmus Universiteit Rotterdam	128	146				210	480		130	106	1200
Herseninstituut			10	6			32	24			72
HFML-Felix			4	2		2	6	2			16
Hubrecht			16			10	36	22			84
Huygens			4	4		16	4	2			30
IISG			6	4		22	6	4			42
KITLV						6	8	4			18
Maastricht University	44	98		6	2	48	86	2	112	72	470
Meertens				2		12	2	4			20
Nikhef					168						168
NIOD		2	6	4		12	6				30
NIOO-KNAW			2	2		14	10	4			32
NIOZ			10	6	4	36	30	16			102
NSCR			2	2		18	16	4			42
Open Universiteit	12	28	4	6	356	4	18	4	40	8	480
Practoraten					46						46
Radbout Universiteit Nijmegen	146	270	50	66	74	114	548	62	190	90	1610
Rijksuniversiteit Groningen	88	282	16	26	244	72	298	60	230	122	1438
Technische Universiteit Delft					2794						2794
Technische Universiteit Eindhoven	20	118	6	18	36	102	148	52	134	82	716
Tilburg University	74	114		6		108	256	10	146	68	782
UMC Groningen	2	28	20	12	4	46	132	26	10	10	290
UMC Utrecht		90				28	60	24	126	62	390
Universiteit Leiden	96	310	4	6	10	138	460	12	236	94	1366
Universiteit Twente	86	120	24	90	22	254	590	12	180	88	1466
Universiteit Utrecht	102	258	74	190	72	284	342	2	406	172	1902
Universiteit van Amsterdam					2658						2658
Universiteit voor Humanistiek	2	10			4	4	34		12	2	68
Vrije Universiteit Amsterdam	260	218				282	472		246	130	1608
Westerdijk						4					4
Grand total	1060	2094	286	464	6514	1912	4170	378	2198	1106	20182

20 Appendix III: **estimation** of the distribution of respondents across institutions and positions (total N=981)

The table below is an estimation of the distribution of survey respondents across institutions and job positions. It was not possible to link the institutions and job positions from the web scraping to the individual survey IDs directly, because survey IDs were anonymized. However, we could make an averaged estimation of the institutions of respondents. This estimation has an error margin, which means that the large numbers are reasonably accurate, but the small numbers are prone to error. It was not necessary to use the estimates of the job positions in our results, because job positions could also be obtained from a survey question (self-report of the respondents).

Institute	Lecturer (Docent)	Professor (Hoogleraar)	IT/data/ research support	Management	Not collected	Researcher	PhD	Postdoc	UD	UHD	#N/B	Grand total
AMOLF							1		1			2
ASTRON						1	2		1			4
CWI						3						3
DANS			2			1						3
DIFFER					2							2
Erasmus Universiteit Rotterdam	6	9			4	11	14		6	3		53
Herseninstituut			1	1			1	1				4
Hubrecht			3									3
Huygens					1							1
Maastricht University		8				2	1	1	6	6		24
Meertens							1					1
Nikhef				1	8							9
NIOD		1					1					2
NIOO-KNAW						2	1					3
NIOZ				3		1		1	1			6
NSCR							1	2				3
Open Universiteit		1			9		2	1	3	1		17
Practoraten					4							4
Radbout Universiteit Nijmegen	1	17	2	1	2	1	21	7	17	2		71
Rijksuniversiteit Groningen	2	19		3	9	2	8	1	14	5		63
Technische Universiteit Delft					97							97
Technische Universiteit Eindhoven	1	6		4	2	2	5	2	11	2		35
Tilburg University	1	4				2	6		9	2		24
UMC Groningen		2	2	2		1	7		2			16
UMC Utrecht		7				1	1	1	9	4	1	24
Universiteit Leiden	5	19				4	14	1	21	4	1	69
Universiteit Twente	2	10		5	3	5	23		22	4	2	76
Universiteit Utrecht	3	13	3	5	3	20	23		23	15	4	112
Universiteit van Amsterdam					121	3						124
Universiteit voor Humanistiek							1	2	2			5
Vrije Universiteit Amsterdam	7	12				12	30	7	14	11	3	96
#N/B										13	12	25
Grand total	28	128	13	25	265	74	164	27	162	72	23	981

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