ACADEMY OF FINLAND

STATE OF SCIENTIFIC RESEARCH IN FINLAND 2016

Survey on the role of doctoral degree holders in society

Updated 10 January 2017

Read more at: www.aka.fi/tieteentila
Planning and Management Support Unit
Academy of Finland

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1. Broader impact of research in the State of Scientific Research in Finland 2016 review

A special theme in the State of Scientific Research in Finland 2016 review[1] was to explore the broader impact or research in society by combining qualitative and quantitative methods. The review analysed the different types of impact arising from research and research-based knowledge as well as the pathways through which impact is realised.

The impact of research beyond academia was explored from the direction of research activities, focusing on four different research fields:

- ecology, evolutionary biology and ecophysiology
- history
- materials science and technology
- medical engineering and health technologies

A large survey and interview dataset was collected from these research fields. This document contains information of the survey on the role of doctoral degree holders in society. The anonymised data generated in this survey will be opened to the use of researchers and other interested parties in 2017. It can be found in a research data search service provided by the Ministry of Education and Culture (etsin.avointiede.fi/en)

2. The purpose, target group and implementation of the survey

The purpose of the survey was to collect data on the employment and careers of doctoral degree holders, the importance of research-based abilities in working life as well as the broader impacts of such abilities beyond individual careers. The target group of the survey consisted of Finnish residents who had been awarded a doctoral degree in the above mentioned fields from a Finnish university between 2005 and 2015. Potential participants were identified by gathering degree information from relevant universities. Their postal addresses were found from the Population Register Centre. The number of invited participants was 1 723.

The survey was implemented with an online survey tool Webropol. The survey invitation, including a link and password to the online questionnaire, was sent to potential participants by post. The survey was open from May 9 to June 1, 2016. One reminder was sent to all invitees before the survey was closed.

The total number of responses was 566; the response rate was 33%. The number of responses from each research field were:

- ecology, evolutionary biology and ecophysiology: 140
- history: 124
- materials science and technology: 159
- medical engineering and health technologies: 64

In addition, 79 responses were received from persons who reported that their doctoral degree or dissertation had no relevant connection to any of the above mentioned fields.[2]

[1] The review (available in Finnish only) can be found in pdf-format at www.aka.fi/tieteentila.

[2] In the State of Scientific Research in Finland 2016 review, some of those respondents were allocated to the research fields on the basis of how they described their research field in an open-ended question. In this document, however, the responses of those 79 persons are excluded.

3. Cover letter

SURVEY INVITATION

Helsinki, 29 April 2016

Dear doctoral degree holder,

The Academy of Finland is collecting data on the employment and careers of doctoral degree holders, the importance of research-based abilities in working life as well as the broader impacts of such abilities beyond individual careers. The survey is related to the Academy's the State of Scientific Research in Finland 2016 review, which for the first time will cover also the broader impacts of research in society. Our goal is to make the various impacts arising from research and research-based abilities visible and to illustrate the pathways by which such impacts are realized.

Impacts beyond academia will be mapped within four research fields: 1) ecology, evolutionary biology and ecophysiology, 2) history, 3) materials science and technology, and 4) medical engineering and health technologies. The target group of this survey consists of Finnish residents who have been awarded a doctoral degree in these fields from a Finnish university between 2005 and 2015. Respondents were identified by gathering degree information from relevant universities.

The link to the survey is here: www.aka.fi/sosr > Research impact > Survey on the role of doctoral degree holders in society

Login/password: SA_knowledgewalks

We kindly ask that you respond by 19 May 2016. By participating in the survey, you will also be able to influence the way in which the societal impacts of research-based abilities are discussed in science policy.

NB! Earlier this year, we conducted a research impact survey for active researchers in these same fields in Finland. If you have applied for research funding from the Academy over the last five years, you may have been included in our previous target group as well. In addition, a separate survey on the employment of doctoral degree holders in ecology and evolutionary biology was conducted by the Research Council for Biosciences and Environment in autumn 2015 as part of the follow-up of the previous international evaluation of these research fields in Finland. Despite partly overlapping target groups, the present survey is different and independent from the other surveys, and we encourage all invitees to respond.

The survey is completed anonymously and all responses will be treated confidentially. The results will be published as part of the State of Scientific Research in Finland 2016 review in the form of statistics, summaries and figures from which individual respondents cannot be identified. We plan to open the data generated in the survey to researchers and other interested parties after the publication of the review. In opening the data, we will follow the principles set by the Open Science and Research Initiative (see http://openscience.fi).

For further information about the survey, please contact Science Adviser, Dr Katri Huutoniemi (katri.huutoniemi@aka.fi, tel. +358 295 335 145). For more information about the State of Scientific Research in Finland 2016 review, please contact Senior Science Adviser, Dr Anssi Mälkki (anssi.malkki@aka.fi, tel. +358 295 335 027). Read more about the State of Scientific Research reviews at www.aka.fi/sosr.

Yours sincerely,

Pentti Pulkkinen, Director
Academy of Finland, Planning and Management Support Unit

Address source: Acacemy of Finland's research register of doctorates in ecology (inc. neighboring fields), history, materials science and technology, and medical engineering and health technologies completed between 2005 and 2015.

4. Questionnaire

Academy of Finland's survey on the role of doctoral degree holders in society

BACKGROUND INFORMATION

1. When did you receive your doctoral degree? *

2. Which university awarded your doctoral degree? *

- ◯ Aalto University (or earlier HSE, UIAH, HUT)
- ◯ University of Helsinki
- ◯ University of Eastern Finland (or earlier University of Kuopio, University of Joensuu)
- ◯ University of Jyväskylä
- ◯ University of Lapland
- ◯ Lappeenranta University of Technology
- ◯ University of Oulu
- ◯ Hanken School of Economics
- ◯ University of the Arts Helsinki (or earlier Sibelius Academy, Theatre Academy, Academy of the Fine Arts)
- ◯ Tampere University of Technology
- ◯ University of Tampere
- ◯ University of Turku (or earlier TSE)
- ◯ University of Vaasa
- ◯ Åbo Akademi University

3. Which of the following fields does your doctorate mostly represent? *

Choose the last option only if your doctoral degree or dissertation has no relevant connection to any of the mentioned fields.

- ◯ Ecology, evolutionary biology and ecophysiology
- ◯ History
- ◯ Materials science and technology
- ◯ Medical engineering and health technologies
- ◯ None of the above is relevant / Other, please specify

4. Your current age

5. Your gender

◯ Female ◯ Male

DISSERTATION RESEARCH AND CAREER

6. Dissertation research as part of your work history

Where have you worked before, during and after your dissertation research? Please choose all alternatives that apply to your situation. Work during and before Master's (or equivalent) studies are not taken into account.

	Before	During	After
University	☐	☐	☐
Government research institute	☐	☐	☐
Other public sector organisation	☐	☐	☐
Private or state-owned company/enterprise	☐	☐	☐
Non-profit organisation	☐	☐	☐
Self-employed entrepreneur or freelancer	☐	☐	☐
Personal scholarship/grant	☐	☐	☐
Parental leave	☐	☐	☐
Unemployed	☐	☐	☐
Other employer or work situation, please specify		☐	☐	☐

7. Number of different employers after your dissertation research

Working as self-employed entrepreneur, freelancer or scholarship/grant holder is not taken into account.

- ◯ 0
- ◯ 1
- ◯ 2-4
- ◯ 5 or more

CURRENT EMPLOYER AND DUTIES

8. Your current employer or work situation *

Choose one or more options. In the accompanying text field(s), enter the name of or other information on your employer (optional). Mark the most important in the latter column.

- ☐ University ◯
- ☐ Government research institute ◯
- ☐ Other public-sector organisation ◯
- ☐ Private or state-owned company/enterprise ◯
- ☐ Non-profit organisation ◯
- ☐ Independent entrepreneur, self-employed or freelancer ◯
- ☐ Personal scholarship/grant ◯
- ☐ Parental leave ◯
- ☐ Unemployed ◯
- ☐ Other employer or work situation, please specify ◯

9. Where is your (primary) workplace/post located? *

- ◯ In Finland, please enter the postal code
- ◯ Abroad, please enter the country
- ◯ Other, please specify

10. Which of the following tasks are included in your current job description?

Choose one or more options. This classification is used in the national career monitoring of Master's and doctoral degree holders; it does not cover all dimensions of expert work, but you can specify your selection(s) in the accompanying text field(s).

- ☐ Research or R&D
- ☐ Teaching or education
- ☐ Planning or development
- ☐ Managerial or supervisory duties

- [ ] Administrative duties
- [ ] Customer service or patient care
- [ ] Consulting or training
- [ ] Office work
- [ ] Financing and financial administration
- [ ] Communications and media
- [ ] Marketing and sales
- [ ] Legal work
- [ ] Religious work
- [ ] Artistic work
- [ ] Other, please specify

IMPORTANCE OF RESEARCH-BASED ABILITIES IN CAREER

In this section, we will survey the importance of research-based knowledge, understanding, vision and skills in your career (hereafter: "research-based abilities"; cf. elements listed in question 11).

11. Which research-based abilities have been important in your career?

Please assess the importance of the following abilities in terms of your career.
(5 = very important, 4 = fairly important, 3 = neither important nor unimportant, 2 = fairly unimportant, 1 = unimportant, IDK = I don't know)

	5	4	3	2	1	IDK
Scientific content or substance	○	○	○	○	○	○
Broad understanding of your field	○	○	○	○	○	○
General understanding of scientific research and academia at large	○	○	○	○	○	○
Capacity for multisectoral/multidisciplinary collaboration	○	○	○	○	○	○
Contacts with researchers and other scientific players	○	○	○	○	○	○
Skills related to searching for, adopting and critically examining knowledge	○	○	○	○	○	○
Ability to piece together and solve problems	○	○	○	○	○	○
Managing large-scale projects	○	○	○	○	○	○
Other ability, please specify	○	○	○	○	○	○

12. In what context have the research-based abilities been useful in your career?

Please assess the importance of your research-based abilities in the following contexts.
(5 = very important, 4 = fairly important, 3 = neither important nor unimportant, 2 = fairly unimportant, 1 = unimportant, IDK = I don't know)

	5	4	3	2	1	IDK
Applying for your current job	○	○	○	○	○	○
Performing your current duties	○	○	○	○	○	○
Recruitments over the course of your career	○	○	○	○	○	○
Performing your previous duties	○	○	○	○	○	○

13. What added value have you gained in the workplace by being trained as a doctor?

Please assess the extent to which your research-based abilities have enhanced your career opportunities in the following respects.
(5 = very much, 4 = fairly much, 3 = somewhat, 2 = a little, 1 = not at all, IDK = I don't know)

	5	4	3	2	1	IDK
Employment, position, or career development	○	○	○	○	○	○
More demanding or interesting duties	○	○	○	○	○	○
Influence, or opportunities to make a difference	○	○	○	○	○	○
Development of personal outlook or vision	○	○	○	○	○	○
Other added value, please specify	○	○	○	○	○	○

BROADER IMPACT OF RESEARCH-BASED ABILITIES

In this section, we will survey the impact of your research-based abilities beyond your own work/career.

14. What kind of expert community do you currently belong to?

Choose one or more expert communities that characterise your professional activities.

- ☐ Research group or research network (e.g. focusing on a particular topic)
- ☐ Scientific/academic community (wider than above, e.g. consisting of researchers working in a research field)
- ☐ Occupational community (e.g. museum professionals, physicians, foresters)
- ☐ Research and/or development unit (e.g. within a company or public utility)
- ☐ Laboratory or research station (e.g. in hospital or experimental research)
- ☐ Expert organisation or network (e.g. in administration, business, or civil society)
- ☐ Local or regional community of experts (e.g. science park, business incubator)
- ☐ Educational community (e.g. college, society, or company with educational focus)
- ☐ Other expert community, please specify

15. Where do the activities of this expert community have an effect?

Please specify the area in which the intended effects of your activities manifest themselves.

- ○ Finland: local or regional
- ○ Finland: national
- ○ Other country
- ○ International
- ○ Universal or independent of location

16. In what ways do your current work/professional activities relate to academic research and know-how? *

Please assess the relevance of the following activities in your current job description.
(5 = highly relevant, 4 = relevant, 3 = somewhat relevant, 2 = of minor relevance, 1= irrelevant, IDK = I don't know)

	5	4	3	2	1	IDK
Producing new knowledge and/or educating new professionals	○	○	○	○	○	○
Applying scientific knowledge in practice (e.g. innovation activities, development work)	○	○	○	○	○	○
Conveying research-based expertise and skills to junior colleagues (e.g. mentoring, training)	○	○	○	○	○	○
Distributing research-based knowledge to other experts (e.g. multisectoral collaboration, mobility between organisations)	○	○	○	○	○	○
Disseminating, interpreting or critically examining research-based knowledge (e.g. science communication, popular articles)	○	○	○	○	○	○
Identifying and highlighting (new) demands for research, education or innovation (e.g. communicating the needs of public sector to the academic community)	○	○	○	○	○	○
Administrating research, education or innovation activities (e.g. funding, structural development)	○	○	○	○	○	○
Monitoring and commenting on research, education or innovation activities (e.g. statements, reports)	○	○	○	○	○	○

17. Please briefly describe where, how and for what purpose you use your research-based abilities.

18. Factors that influence the impact of research-based abilities

Please assess the following factors in terms of your current professional activities.

Your research-based expertise:

a) My research-based expertise is

irrelevant or outdated ◯ ◯ ◯ ◯ ◯ relevant and up-to-date

b) My doctoral degree

weakens my credibility ◯ ◯ ◯ ◯ ◯ strengthens my credibility

c) My research-based expertise

does not empower me to pursue important goals ◯ ◯ ◯ ◯ ◯ empowers me to pursue important goals

d) For sharing and using my research-based expertise

there is no time or resources ◯ ◯ ◯ ◯ ◯ there are enough time and resources

Your professional environment:

e) *Trust* in research-based knowledge/expertise

is weak ◯ ◯ ◯ ◯ ◯ is strong

f) The *relevance* of research-based knowledge/expertise

is often questioned ◯ ◯ ◯ ◯ ◯ is mostly indisputable

g) The *relative importance* of research-based knowledge/expertise

is often low in practice ◯ ◯ ◯ ◯ ◯ is often high in practice

h) *Competition* for research-based knowledge/expertise

limits its extensive use ◯ ◯ ◯ ◯ ◯ encourages its extensive use

19. Please elaborate on the factors that enable and limit the use of your research-based expertise.

Enabling factors

Limiting factors

20. What is the significance/added value of your research-based expertise for society? *

Please describe in concrete terms what tasks in society would remain unaccomplished were you not to contribute to them with your research-based expertise. Consider both the impact of your expert community and your own contribution to the performance of that community.

5. Summary of responses

BACKGROUND INFORMATION

1. When did you receive your doctoral degree?

Number of respondents: 487

	Ecology, evolutionary biology and ecophysiology (N=140)	History (N=124)	Materials science and technology (N=159)	Medical engineering and health technologies (N=64)
2005	20	25	18	5
2006	14	10	16	4
2007	14	10	7	2
2008	12	10	15	5
2009	12	15	15	5
2010	14	9	17	2
2011	17	10	10	11
2012	11	9	20	9
2013	12	13	18	10
2014	13	13	16	9
2015	1	0	7	2

2. Which university awarded your doctoral degree?

Number of respondents: 487

	Ecology, evolutionary biology and ecophysiology (N=140)	History (N=124)	Materials science and technology (N=159)	Medical engineering and health technologies (N=64)
Aalto University (or earlier HSE, UIAH, HUT)	0	0	40	13
University of Helsinki	61	46	21	1
University of Eastern Finland (or earlier University of Kuopio, University of Joensuu)	26	11	11	10
University of Jyväskylä	19	20	22	1
University of Lapland	0	0	0	0
Lappeenranta University of Technology	0	0	5	0
University of Oulu	21	11	22	9
Hanken School of Economics	0	0	0	0
University of the Arts Helsinki (or earlier SibA, TeaK, Academy of the Fine Arts)	0	3	0	0
Tampere University of Technology	0	0	18	20
University of Tampere	0	12	0	4
University of Turku (or earlier TSE)	9	20	2	6
University of Vaasa	0	0	0	0
Åbo Akademi University	4	1	18	0

3. Which of the following fields does your doctorate mostly represent?

Choose the last option only if your doctoral degree or dissertation has no relevant connection to any of the mentioned fields.

Number of respondents: 487

	Ecology, evolutionary biology and ecophysiology (N=140)	History (N=124)	Materials science and technology (N=159)	Medical engineering and health technologies (N=64)
Ecology, evolutionary biology and ecophysiology	140	0	0	0
History	0	124	0	0
Materials science and technology	0	0	159	0
Medical engineering and health technologies	0	0	0	64

4. Your current age

Number of respondents: 483

	Ecology, evolutionary biology and ecophysiology (N=139)	History (N=124)	Materials science and technology (N=158)	Medical engineering and health technologies (N=64)
Average	*40,8*	*48,3*	*39,1*	*37,8*
Median	*38,5*	*45,5*	*38*	*36*

5. Your gender

Number of respondents: 485

	Ecology, evolutionary biology and ecophysiology (N=139)	History (N=124)	Materials science and technology (N=158)	Medical engineering and health technologies (N=64)
Female	83	57	47	29
Male	56	67	111	35

DISSERTATION RESEARCH AND CAREER

6. Dissertation research as part of your work history

Where have you worked before, during and after your dissertation research? Please choose all alternatives that apply to your situation. Work during and before Master's (or equivalent) studies are not taken into account.

Number of respondents: 487

University	Ecology, evolutionary biology and ecophysiology (N=266)	History (N=170)	Materiaalitiede ja -tekniikka (N=327)	Medical engineering and health technologies (N=131)
Before	76	36	100	39
During	103	72	141	53
After	87	62	86	39

Government research institute	Ecology, evolutionary biology and ecophysiology (N=109)	History (N=10)	Materiaalitiede ja -tekniikka (N=35)	Medical engineering and health technologies (N=13)
Before	40	4	10	5
During	36	4	7	5
After	33	2	18	3

Other public sector organisation	Ecology, evolutionary biology and ecophysiology (N=65)	History (N=120)	Materiaalitiede ja -tekniikka (N=27)	Medical engineering and health technologies (N=56)
Before	26	47	7	11
During	16	35	3	17
After	23	38	17	28

Private or state-owned company/enterprise	Ecology, evolutionary biology and ecophysiology (N=68)	History (N=43)	Materiaalitiede ja -tekniikka (N=147)	Medical engineering and health technologies (N=52)
Before	32	26	46	13
During	14	6	22	10
After	22	11	79	29

Non-profit organisation	Ecology, evolutionary biology and ecophysiology (N=15)	History (N=49)	Materiaalitiede ja -tekniikka (N=2)	Medical engineering and health technologies (N=0)
Before	7	18	0	0
During	3	13	0	0
After	5	18	2	0

Self-employed entrepreneur or freelancer	Ecology, evolutionary biology and ecophysiology (N=18)	History (N=41)	Materiaalitiede ja -tekniikka (N=12)	Medical engineering and health technologies (N=11)
Before	5	9	2	2
During	4	11	3	3
After	9	21	7	6

Personal scholarship/grant	Ecology, evolutionary biology and ecophysiology (N=139)	History (N=150)	Materiaalitiede ja -tekniikka (N=68)	Medical engineering and health technologies (N=44)
Before	12	31	6	5
During	82	74	48	30
After	45	45	14	9

Parental leave	Ecology, evolutionary biology and ecophysiology (N=72)	History (N=67)	Materiaalitiede ja -tekniikka (N=49)	Medical engineering and health technologies (N=31)
Before	5	14	7	4
During	31	28	15	14
After	36	25	27	13

Unemployed	Ecology, evolutionary biology and ecophysiology (N=81)	History (N=66)	Materiaalitiede ja -tekniikka (N=36)	Medical engineering and health technologies (N=21)
Before	22	18	5	3
During	13	17	3	3
After	46	31	28	15

Other employer or work situation, please specify	Ecology, evolutionary biology and ecophysiology (N=13)	History (N=10)	Materiaalitiede ja -tekniikka (N=8)	Medical engineering and health technologies (N=2)
Before	5	4	1	1
During	2	3	0	0
After	6	3	7	1

7. Number of different employers after your dissertation research

Working as self-employed entrepreneur, freelancer or scholarship/grant holder is not taken into account.

Number of respondents: 484

	Ecology, evolutionary biology and ecophysiology (N=139)	History (N=122)	Materials science and technology (N=159)	Medical engineering and health technologies (N=64)
0	9	13	8	0
1	64	57	66	25
2-4	63	45	84	33
5 or more	3	7	1	6

CURRENT EMPLOYER AND DUTIES

8. Your current employer or work situation

Choose one or more options. In the accompanying text field(s), enter the name of or other information on your employer (optional). Mark the most important in the latter column.

Number of respondents: 487

	Ecology, evolutionary biology and ecophysiology (N=140)	History (N=124)	Materials science and technology (N=159)	Medical engineering and health technologies (N=64)
University	56	53	51	21
Government research institute	23	1	14	2
Other public-sector organisation	18	31	11	17
Private or state-owned company/enterprise	17	7	69	26
Non-profit organisation	2	8	3	0
Independent entrepreneur, self-employed or freelancer	7	18	6	5
Personal scholarship/grant	7	18	1	4
Parental leave	6	1	4	1
Unemployed	20	12	11	4
Other employer or work situation, please specify	9	14	9	1

Most important employer

Number of respondents: 437

	Ecology, evolutionary biology and ecophysiology (N=128)	History (N=109)	Materials science and technology (N=142)	Medical engineering and health technologies (N=58)
University	45	34	45	12
Government research institute	21	1	11	2
Other public-sector organisation	14	25	7	16
Private or state-owned company/enterprise	15	3	56	21
Non-profit organisation	2	6	1	0
Independent entrepreneur, self-employed or freelancer	2	9	5	1
Personal scholarship/grant	7	9	0	2
Parental leave	1	0	2	0
Unemployed	15	10	8	3
Other emplyer or work situation, please specify	6	12	7	1

9. Where is your (primary) workplace/post located?

Number of respondents: 485

	Ecology, evolutionary biology and ecophysiology (N=139)	History (N=124)	Materials science and technology (N=159)	Medical engineering and health technologies (N=63)
In Finland, please enter the postal code	134	119	157	61
Abroad, please enter the country	2	2	0	0
Other, please specify	3	3	2	2

10. Which of the following tasks are included in your current job description?

Choose one or more options. This classification is used in the national career monitoring of Master's and doctoral degree holders; it does not cover all dimensions of expert work, but you can specify your selection(s) in the accompanying text field(s).

Number of respondents: 463

	Ecology, evolutionary biology and ecophysiology (N=130)	History (N=121)	Materials science and technology (N=150)	Medical engineering and health technologies (N=62)
Research or R&D	92	74	107	47
Teaching or education	42	54	35	17
Planning or development	32	26	43	33
Managerial or supervisory duties	14	22	36	21
Administrative duties	23	24	17	10
Customer service or patient care	3	4	4	11
Consulting or training	11	11	18	9
Office work	12	6	12	2
Financing and financial administration	7	2	3	8
Communications and media	11	7	5	0
Marketing and sales	2	0	12	6
Legal work	2	0	2	0
Religious work	0	4	0	0
Artistic work	0	4	1	0
Other, please specify	9	17	6	6

IMPORTANCE OF RESEARCH-BASED ABILITIES IN CAREER

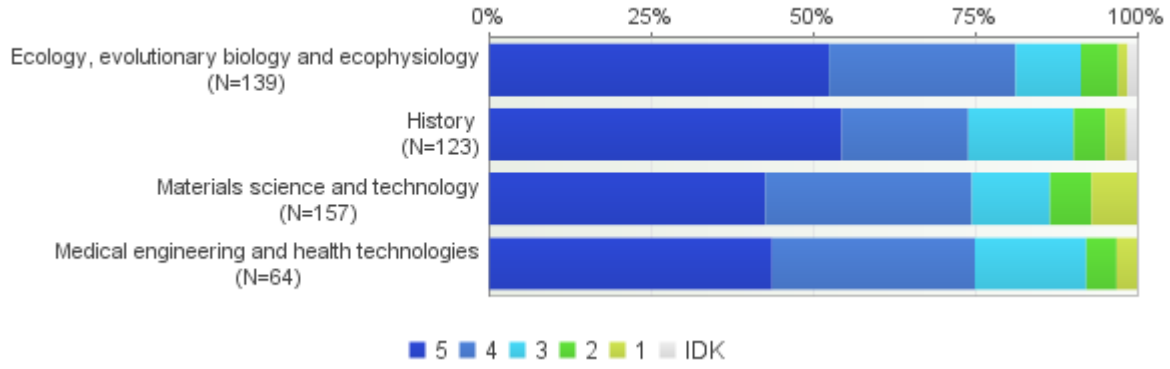
In this section, we will survey the importance of research-based knowledge, understanding, vision and skills in your career (hereafter: "research-based abilities"; cf. elements listed in question 11).

11. Which research-based abilities have been important in your career?

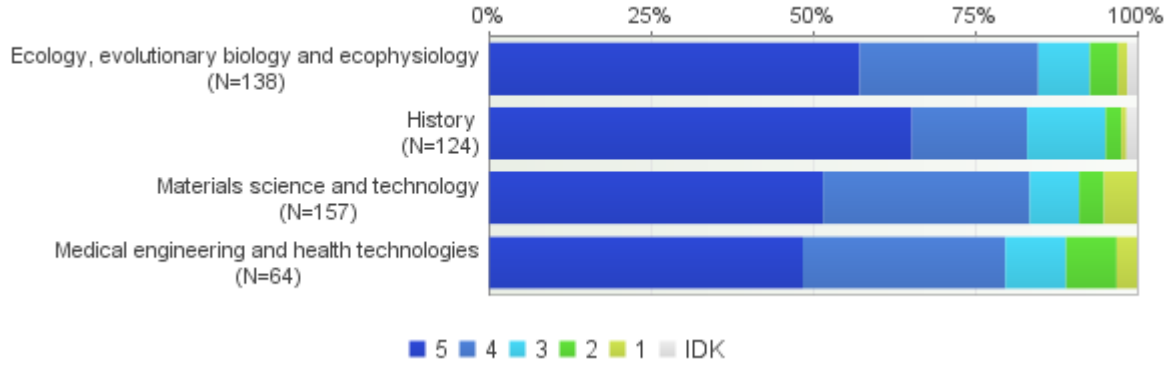
Please assess the importance of the following abilities in terms of your career. (5 = very important, 4 = fairly important, 3 = neither important nor unimportant, 2 = fairly unimportant, 1 = unimportant, IDK = I don't know)

Number of respondents: 486

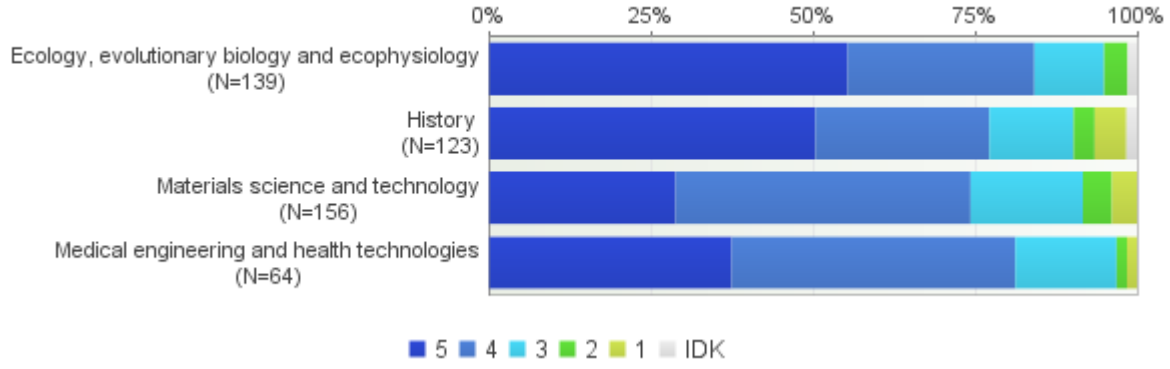
Scientific content or substance



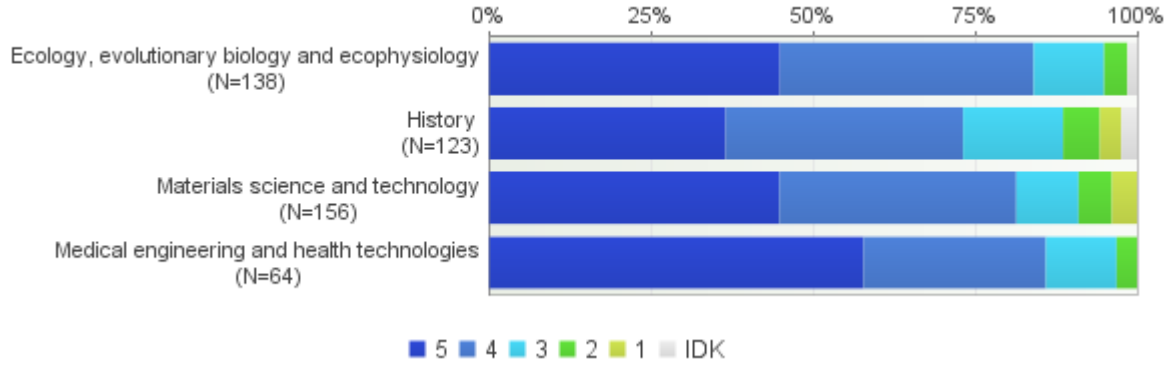
Broad understanding of your field



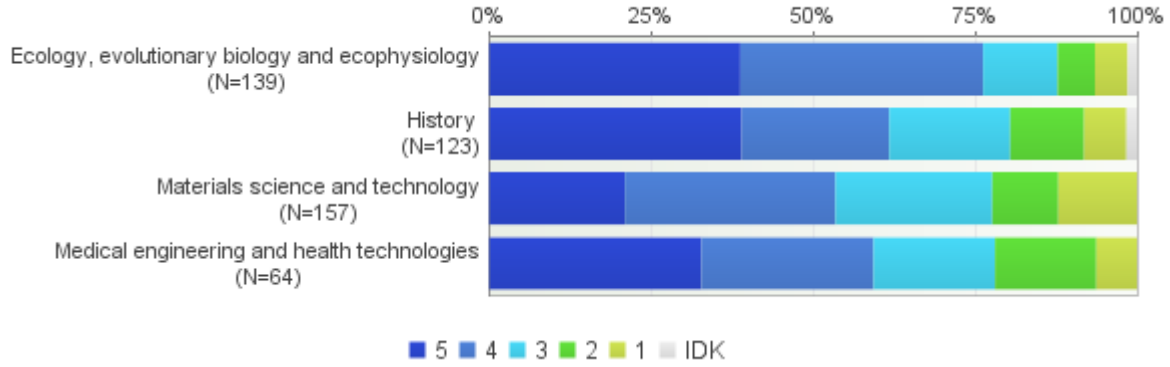
General understanding of scientific research and academia at large



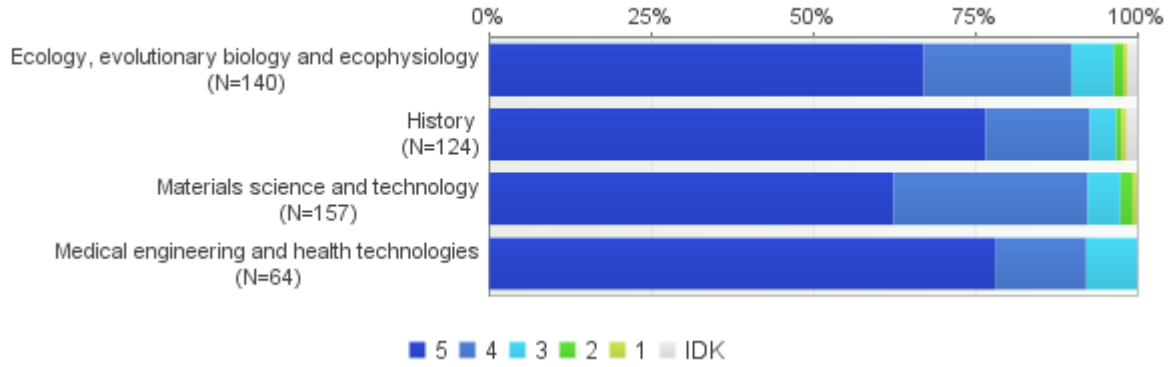
Capacity for multisectoral/multidisciplinary collaboration



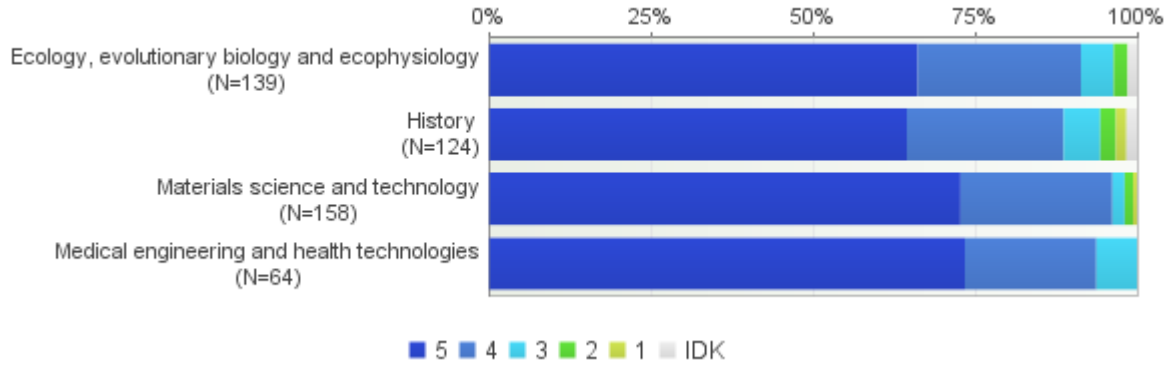
Contacts with researchers and other scientific players



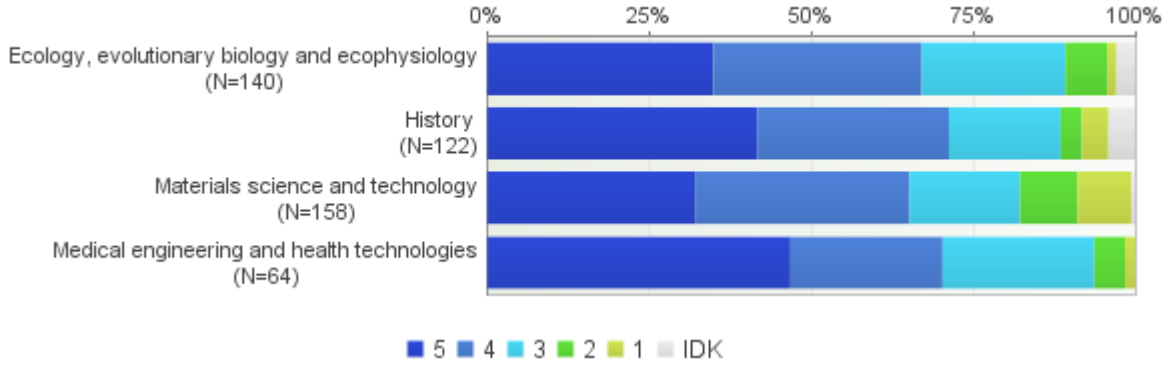
Skills related to searching for, adopting and critically examining knowledge



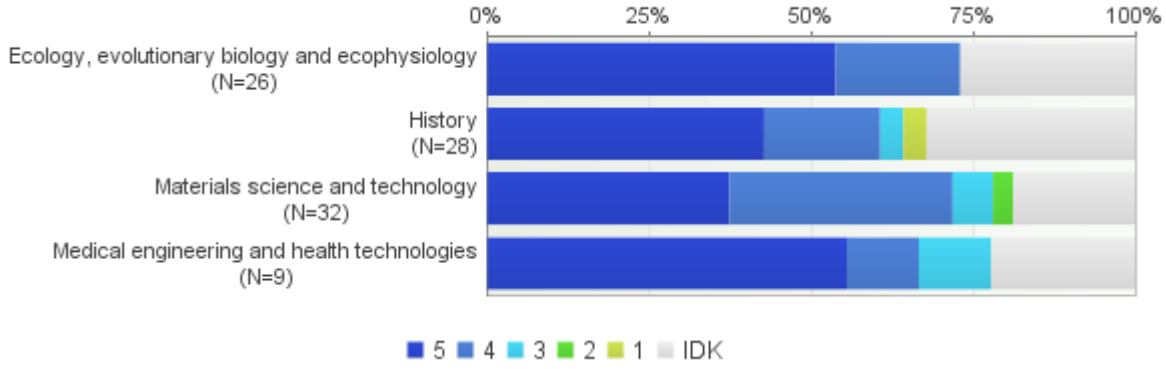
Ability to piece together and solve problems



Managing large-scale projects



Other ability, please specify

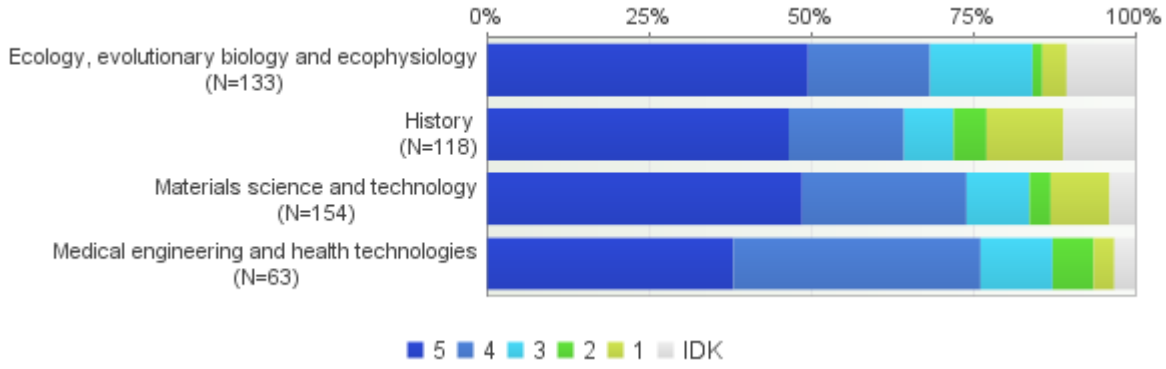


12. In what context have the research-based abilities been useful in your career?

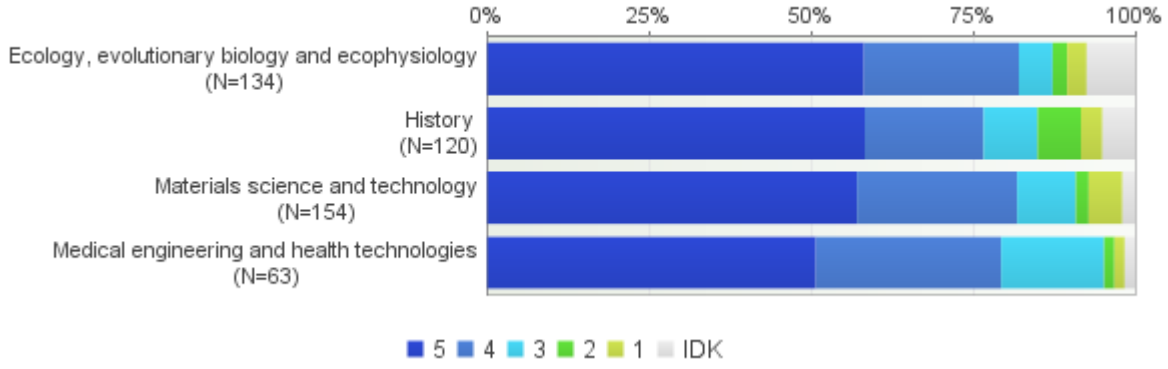
Please assess the importance of your research-based abilities in the following contexts. (5 = very important, 4 = fairly important, 3 = neither important nor unimportant, 2 = fairly unimportant, 1 = unimportant, IDK = I don't know)

Number of respondents: 485

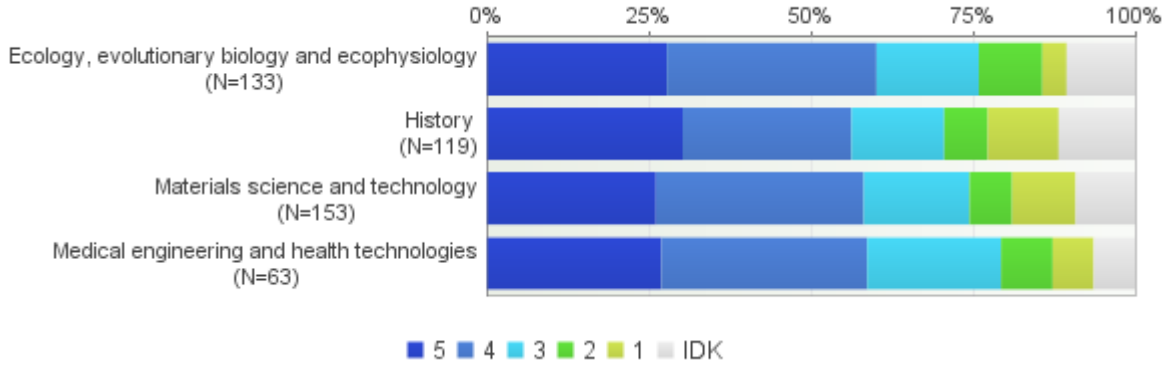
Applying for your current job



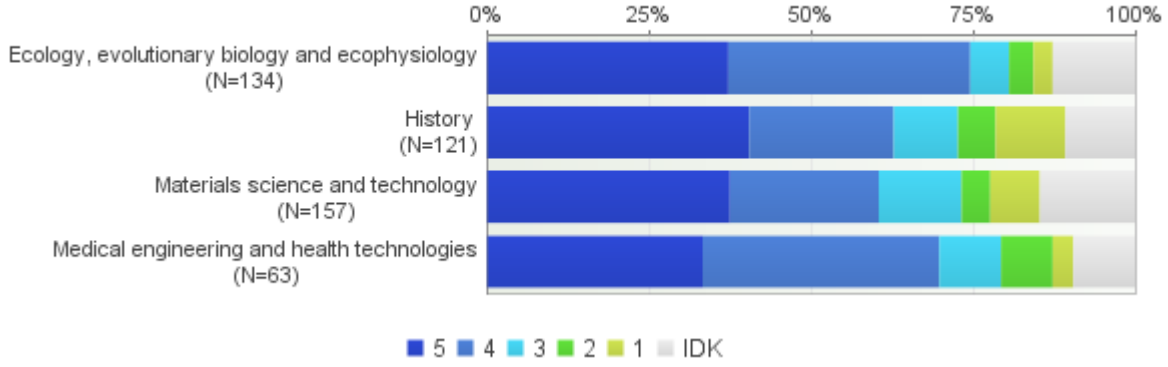
Performing your current duties



Recruitments over the course of your career



Performing your previous duties

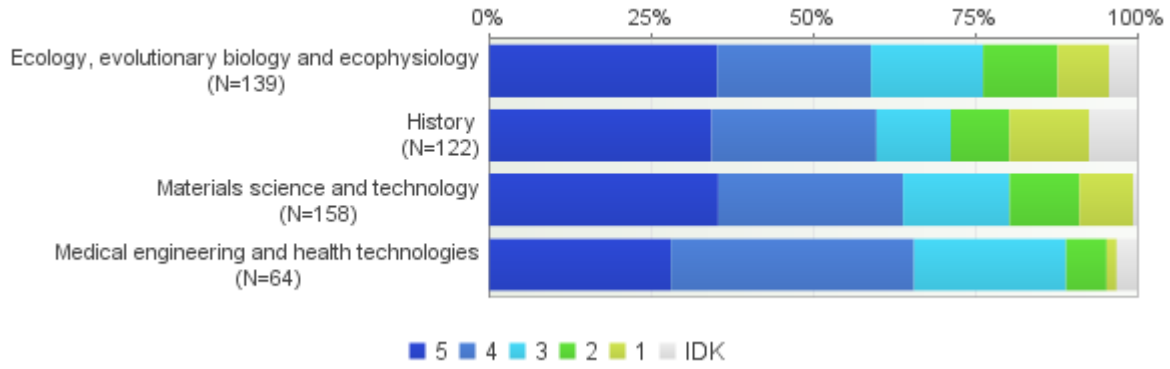


13. What added value have you gained in the workplace by being trained as a doctor?

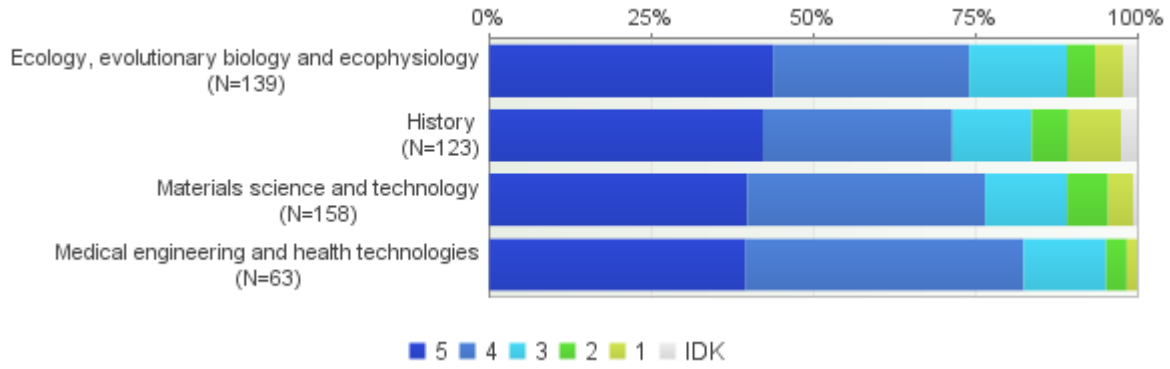
Please assess the extent to which your research-based abilities have enhanced your career opportunities in the following respects. (5 = very much, 4 = fairly much, 3 = somewhat, 2 = a little, 1 = not at all, IDK = I don't know)

Number of respondents: 486

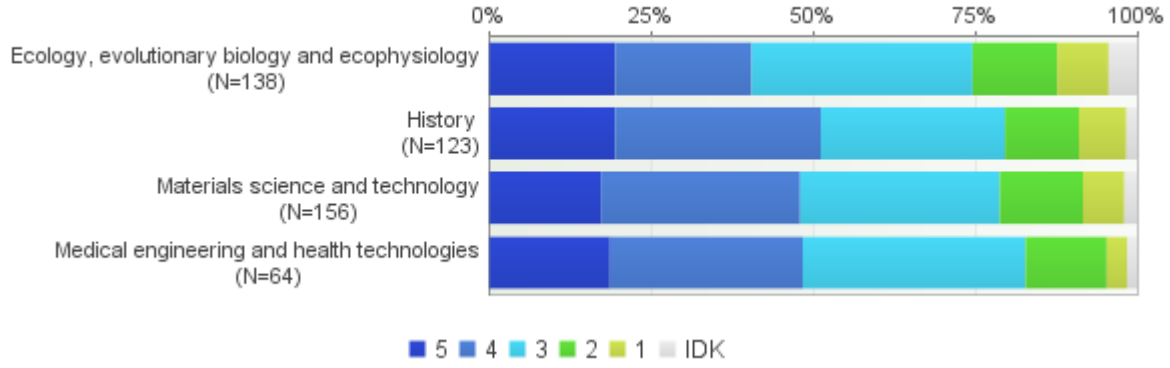
Employment, position, or career development



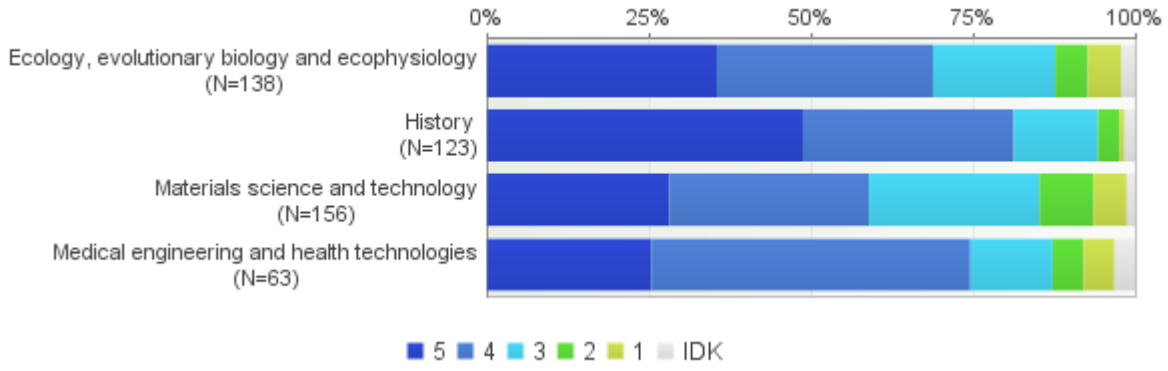
More demanding or interesting duties



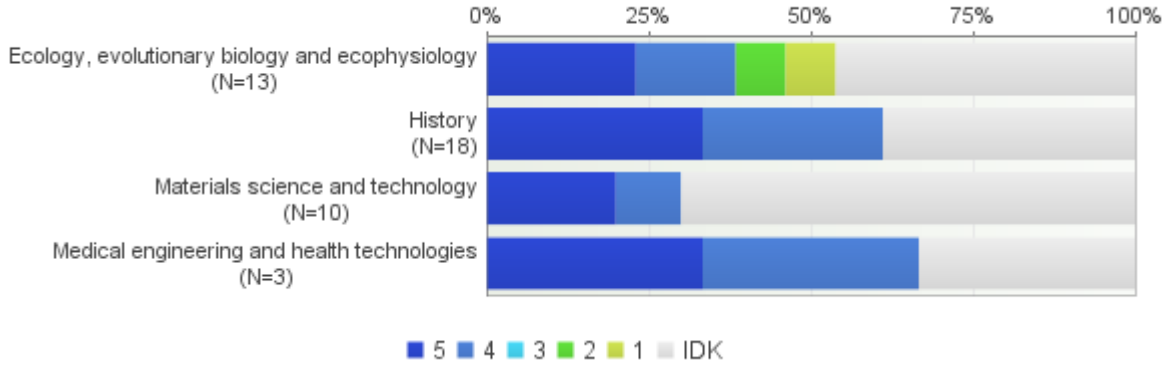
Influence, or opportunities to make a difference



Development of personal outlook or vision



Other added value, please specify



BROADER IMPACT OF RESEARCH-BASED ABILITIES

In this section, we will survey the impact of your research-based abilities beyond your own work/career.

14. What kind of expert community do you currently belong to?

Choose one or more expert communities that characterise your professional activities.

Number of respondents: 469

	Ecology, evolutionary biology and ecophysiology (N=134)	History (N=121)	Materials science and technology (N=151)	Medical engineering and health technologies (N=63)
Research group or research network (e.g. focusing on a particular topic)	76	47	57	28
Scientific/academic community (wider than above, e.g. consisting of researchers working in a research field)	69	66	50	20
Occupational community (e.g. museum professionals, physicians, foresters)	18	16	16	18
Research and/or development unit (e.g. within a company or public utility)	19	10	72	19
Laboratory or research station (e.g. in hospital or experimental research)	7	0	13	9
Expert organisation or network (e.g. in administration, business, or civil society)	45	27	39	17
Local or regional community of experts (e.g. science park, business incubator)	2	1	4	5
Educational community (e.g. college, society, or company with educational focus)	19	29	20	4
Other expert community, please specify	9	15	4	0

15. Where do the activities of this expert community have an effect?

Please specify the area in which the intended effects of your activities manifest themselves.

Number of respondents: 468

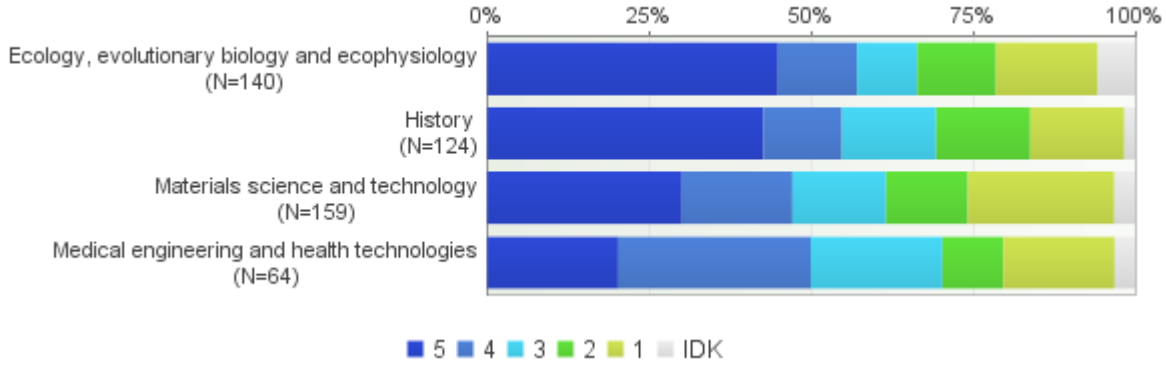
	Ecology, evolutionary biology and ecophysiology (N=134)	History (N=119)	Materials science and technology (N=152)	Medical engineering and health technologies (N=63)
Finland: local or regional	31	35	19	14
Finland: national	42	49	34	16
Other country	2	1	1	0
International	47	29	79	27
Universal or independent of location	12	5	19	6

16. In what ways do your current work/professional activities relate to academic research and know-how?

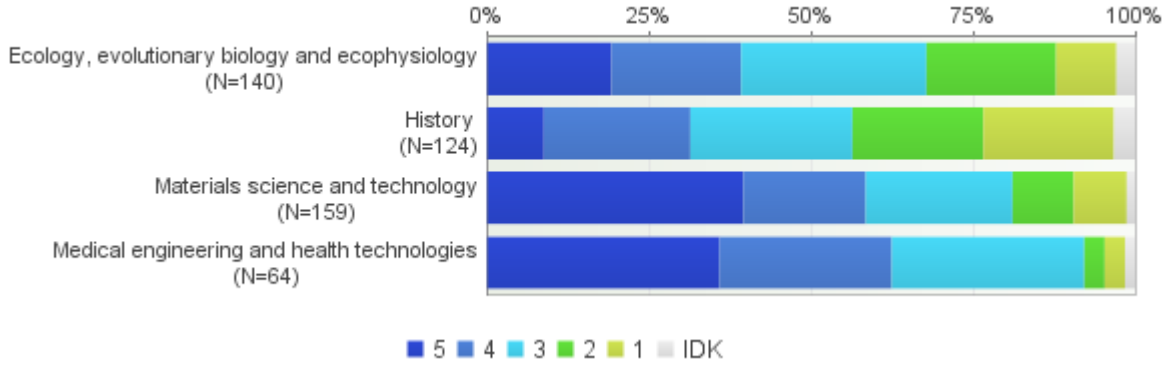
Please assess the relevance of the following activities in your current job description. (5 = highly relevant, 4 = relevant, 3 = somewhat relevant, 2 = of minor relevance, 1= irrelevant, IDK = I don't know)

Number of respondents: 487

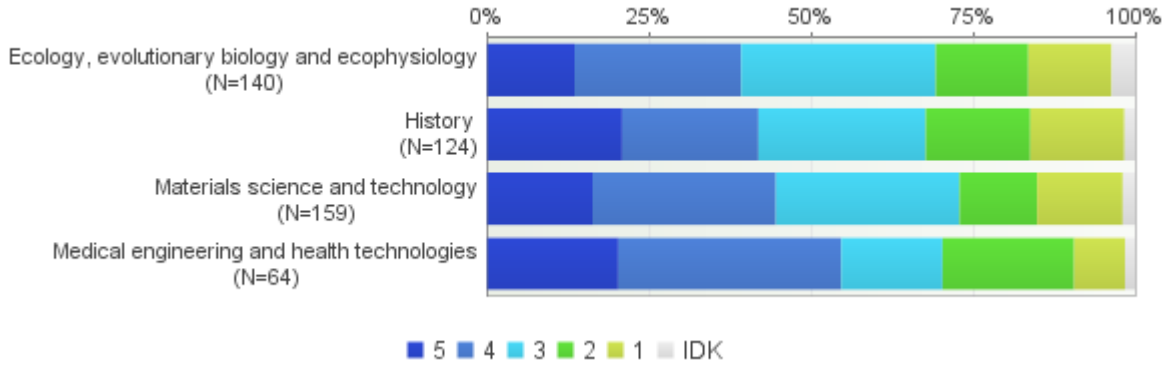
Producing new knowledge and/or educating new professionals



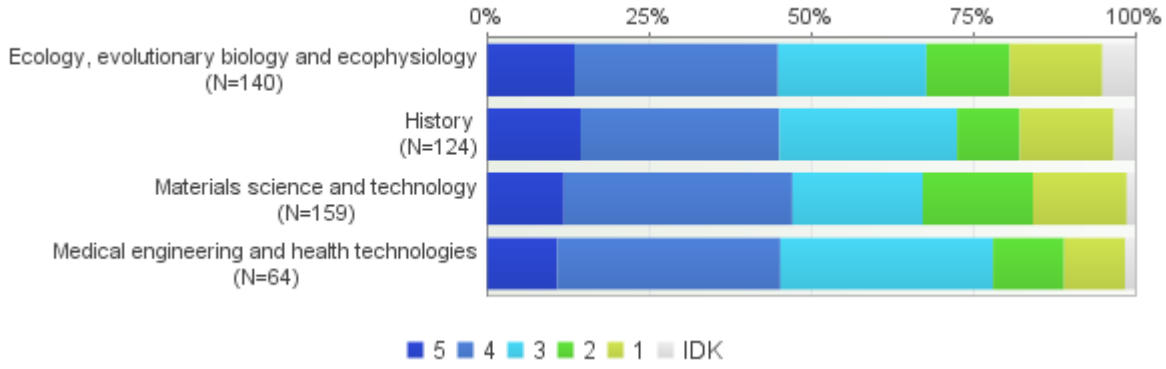
Applying scientific knowledge in practice (e.g. innovation activities, development work)



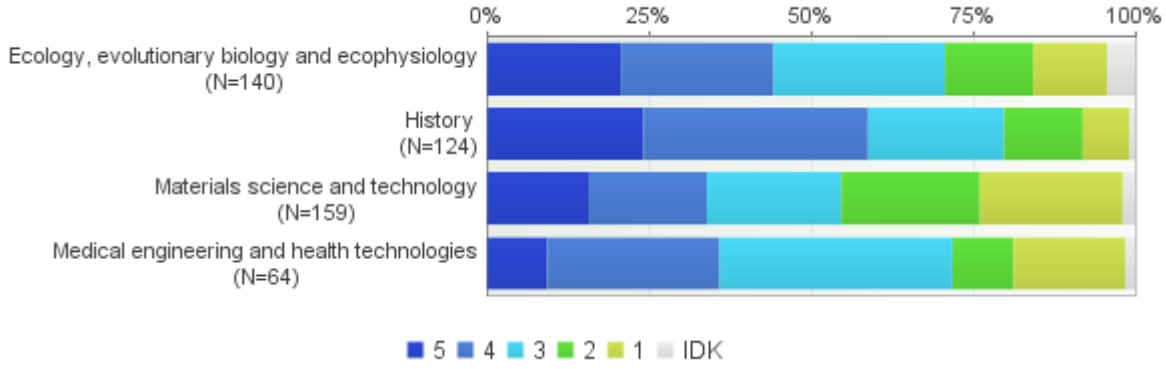
Conveying research-based expertise and skills to junior colleagues (e.g. mentoring, training)



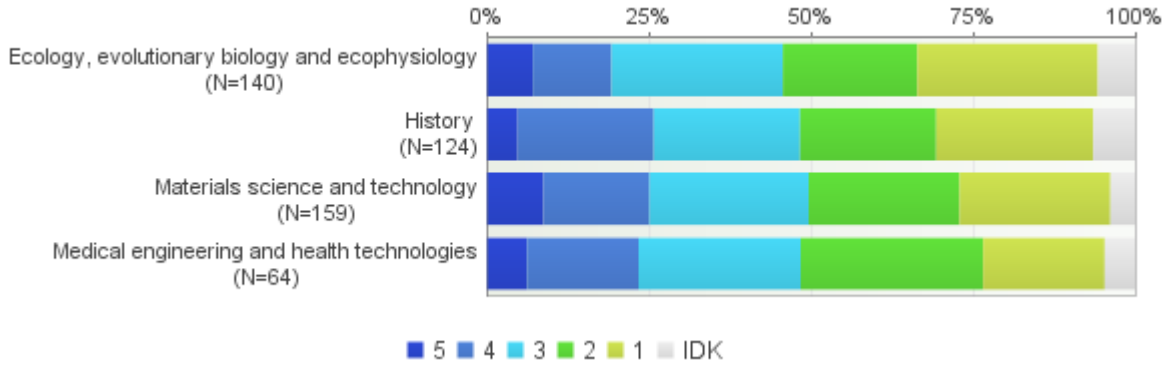
Distributing research-based knowledge to other experts (e.g. multisectoral collaboration, mobility between organisations)



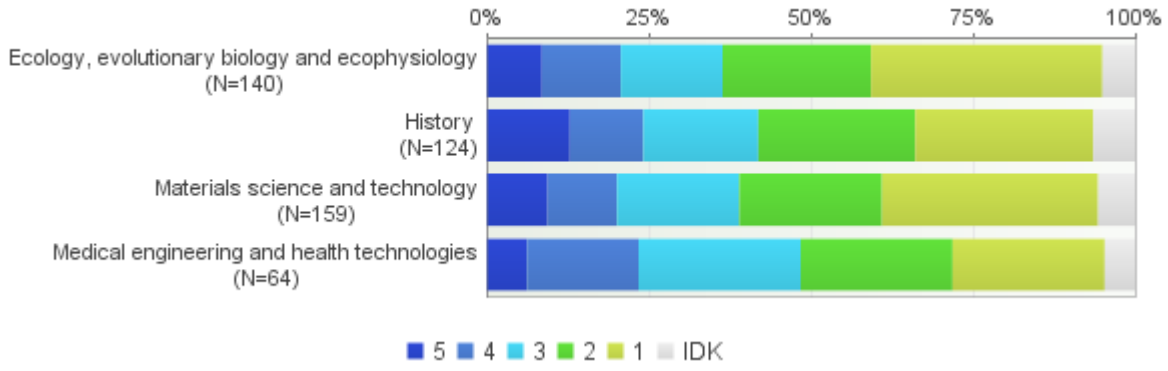
Disseminating, interpreting or critically examining research-based knowledge (e.g. science communication, popular articles)



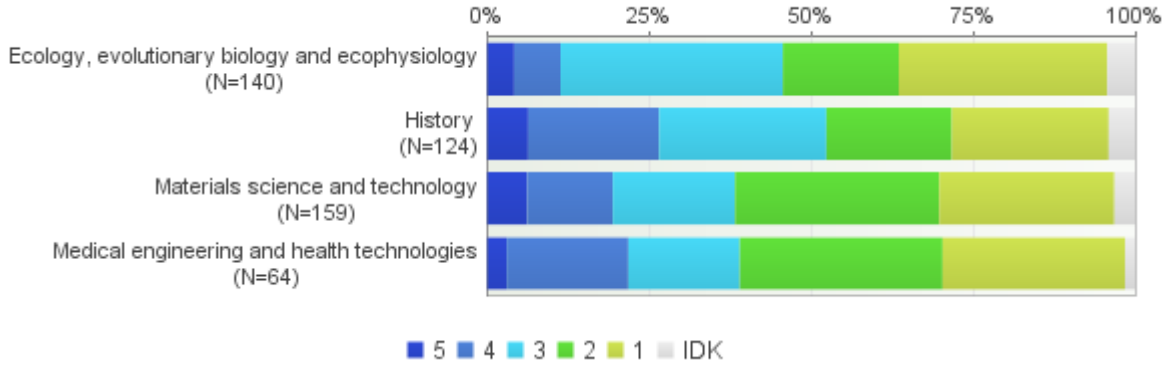
Identifying and highlighting (new) demands for research, education or innovation (e.g. communicating the needs of public sector to the academic community)



Administrating research, education or innovation activities (e.g. funding, structural development)



Monitoring and commenting on research, education or innovation activities (e.g. statements, reports)



17. Please briefly describe where, how and for what purpose you use your research-based abilities.

Number of respondents: 283

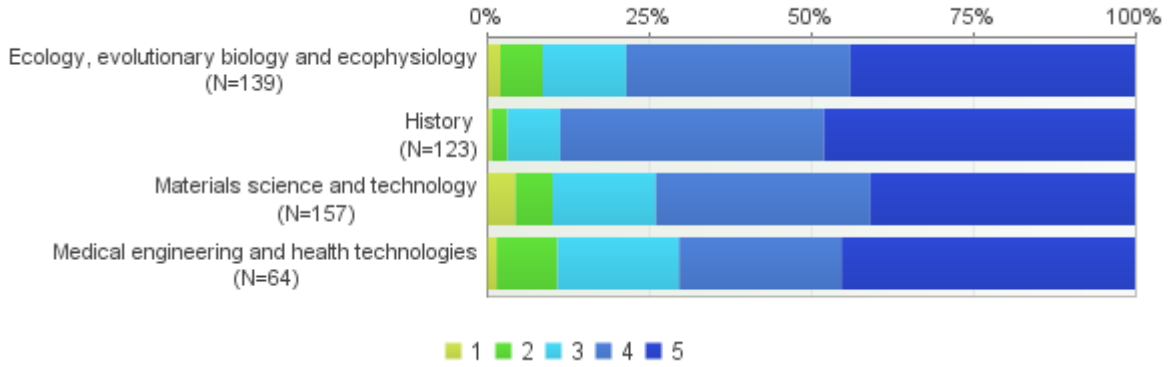
18. Factors that influence the impact of research-based abilities

Please assess the following factors in terms of your current professional activities.

Your research-based expertise:

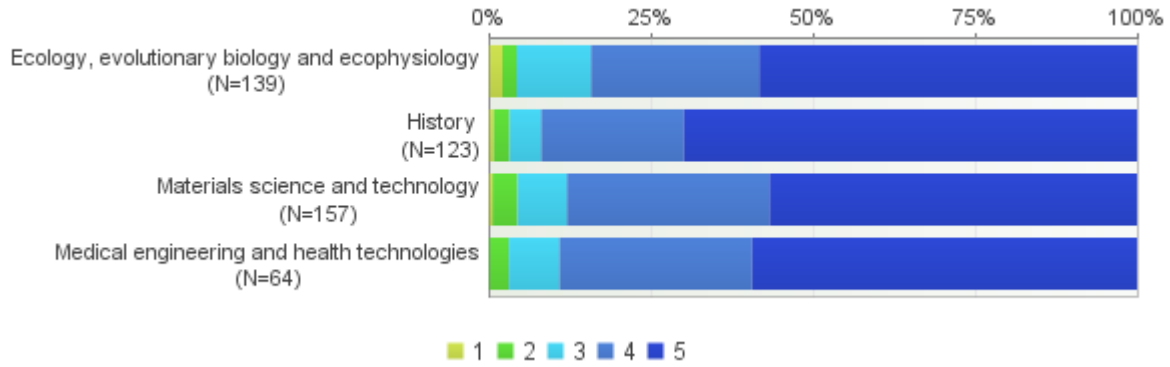
a) My research-based expertise is irrelevant or outdated (1) . . . relevant and up-to-date (5)

Number of respondents: 483



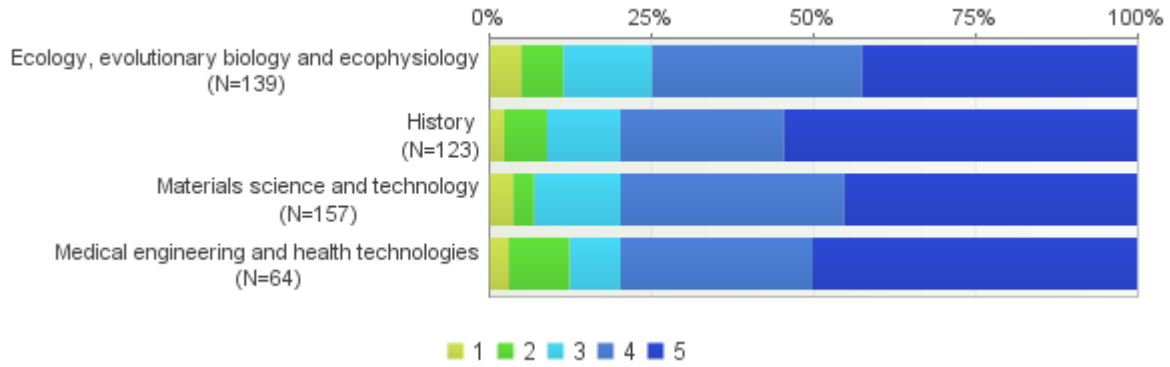
b) My doctoral degree weakens my credibility (1) . . . strengthens my credibility (5)

Number of respondents: 483



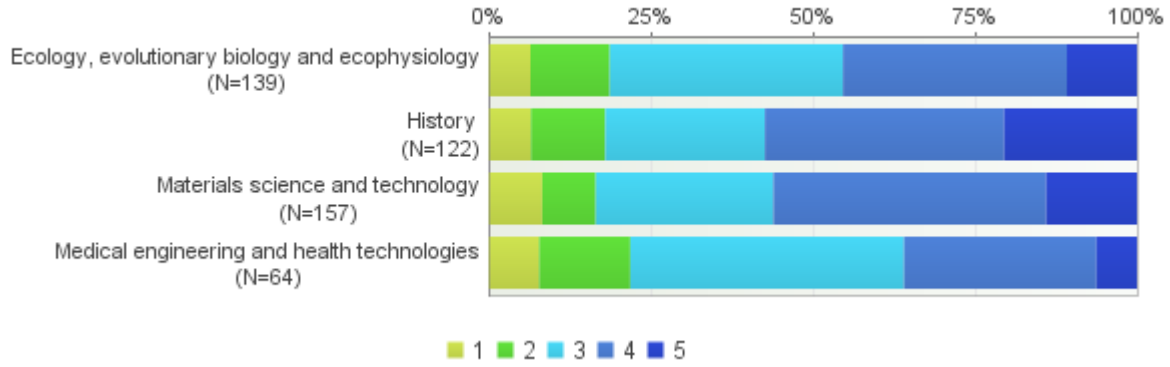
c) My research-based expertise does not empower me to pursue important goals (1) . . . empowers me to pursue important goals (5)

Number of respondents: 483



d) For sharing and using my research-based expertise, there is no time or resources (1) . . . there are enough time and resources (5)

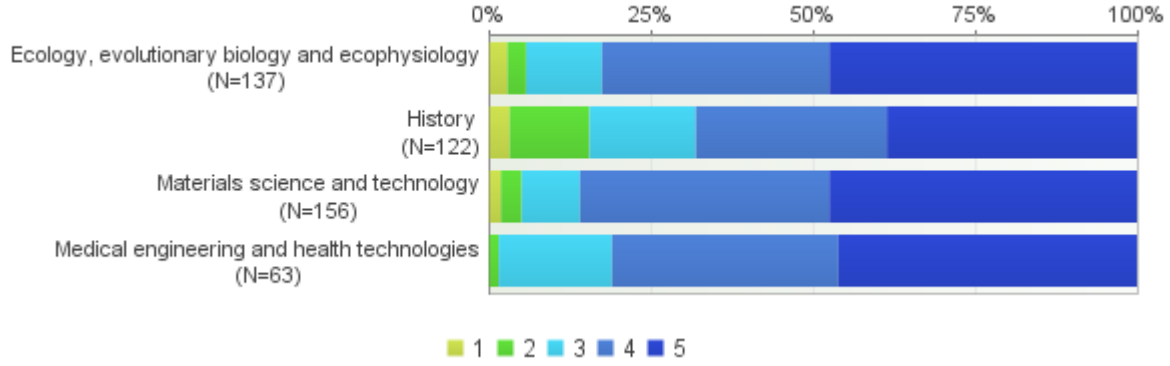
Number of respondents: 482



Your professional environment:

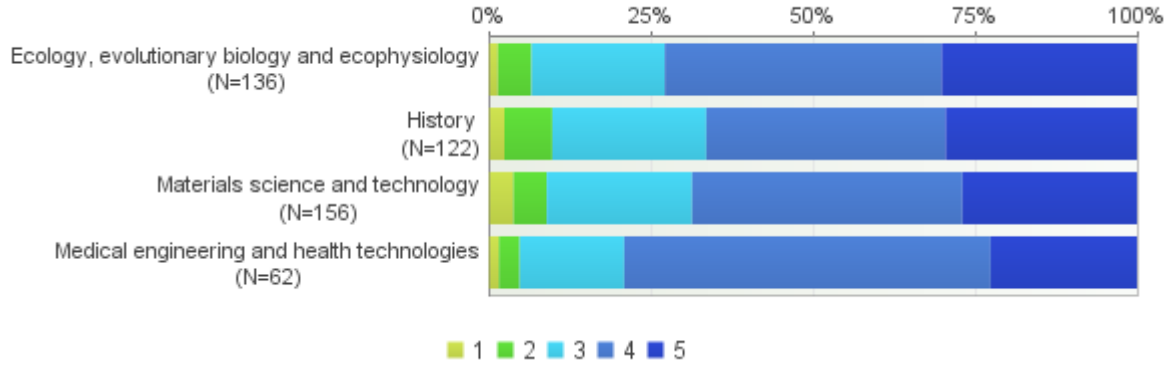
e) Trust in research-based knowledge/expertise is weak (1) . . . is strong (5)

Number of respondents: 478



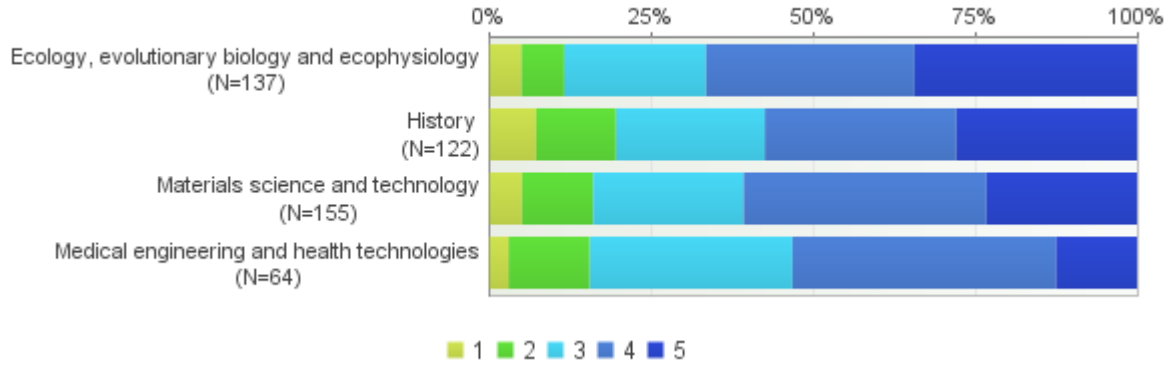
f) The relevance of research-based knowledge/expertise is often questioned (1) . . . is mostly indisputable (5)

Number of respondents: 476



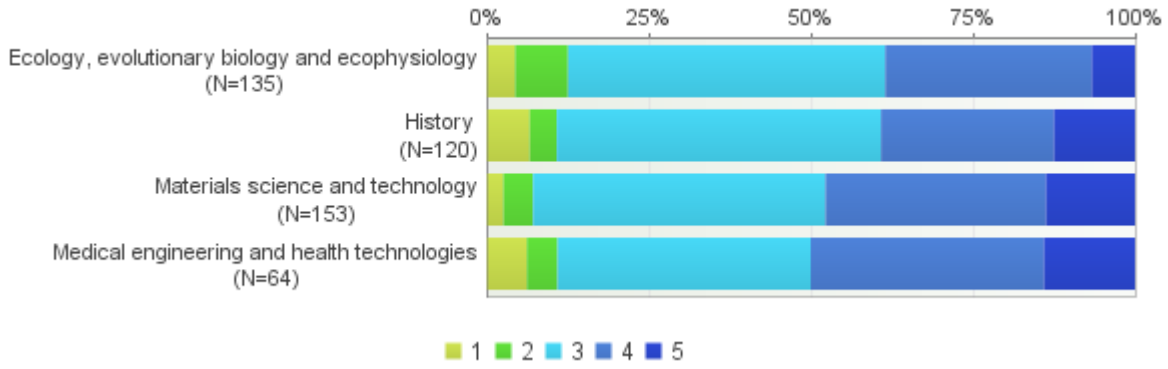
g) The relative importance of research-based knowledge/expertise is often low in practice (1) . . . is often high in practice (5)

Number of respondents: 478



h) Competition for research-based knowledge/expertise limits its extensive use (1) . . . encourages its extensive use (5)

Number of respondents: 472



19. Please elaborate on the factors that enable and limit the use of your research-based expertise

Enabling factors; Limiting factors

Number of respondents: 268

20. What is the significance/added value of your research-based expertise for society?

Please describe in concrete terms what tasks in society would remain unaccomplished were you not to contribute to them with your research-based expertise. Consider both the impact of your expert community and your own contribution to the performance of that community.

Number of respondents: 478