University of Nottingham
UK | CHINA | MALAYSIA

Skills for academia and beyond

Dr Christopher Madan

About Me

- Canadian
- Undergraduate->PhD in Canada, visiting scientist in Germany, postdoctoral researcher in USA, and now—assistant professor here!

- Cognitive science (mixture of psychology, neuroscience, computer science)
  - Memory, decision making, emotion, aging
- Now also interested in doctoral training, skills, post-PhD careers

Overview

- Academic skills and careers
  - Research, Teaching, Services, etc.
- Transferable Skills
- Non-academic careers

What skills are useful/required in academia?

- Topic expertise
- Identifying research questions
- Statistics
- Data visualisation
- Scientific writing
- Public speaking
- Science communication
- Programming
- Supervision
- *...those are some research-related skills, but not everything!*

What skills are useful/required in academia?

- Eiko Fried's blog "Are we asking too much? A list of competencies people expect me to have"
  - https://eiko-fried.com/are-we-asking-too-much-a-list-of-competencies-people-expect-me-to-have/

1. Good understanding of basic statistics
2. Good understanding of more elaborate models: basic SEM such as EFA, CFA, or ESEM; fancier SEM such as latent change score models or latent class analysis; basic IRT
3. Network models, frequentist and Bayesian, for cross sectional and time-series data; extensions such as continuous time-series models

What skills are useful/required in academia?

4. At least a basic idea of Bayesian statistics
5. Pick up cool new methodologies such as machine learning & neural nets quickly
6. Know R well; use Mplus for things R cannot do (e.g. DSEM in Mplus8); use some other programs such as Onyx to visualize models, know JASP well enough to teach students
7. Ability to write at least basic R-packages
8. Write papers in LaTeX, and write R code in Markdown
9. Substantive knowledge in my fields (measurement and modeling of mental illness, and substantive research on mental illness such as RCTs; easily 500 papers per month in decent journals). It feels like this should be more than one point, because it takes up a huge chunk of time...

What skills are useful/required in academia?

10. Have a least a minimal background in philosophy of science
11. Keep up with stats developments (e.g. regsem package)
12. Know or at least learn one proper programming language (e.g. Python)
13. Run a blog to get visibility and increase chances to get tenure
14. Embrace & support open science practices, prepare all your syntax so it can be uploaded, upload your data when possible, write high quality reviews you feel comfortable signing, publish your reviews on publons, etc.
15. Engage in debates on social media
16. Market your research on researchgate, academia, psyarxiv, etc.

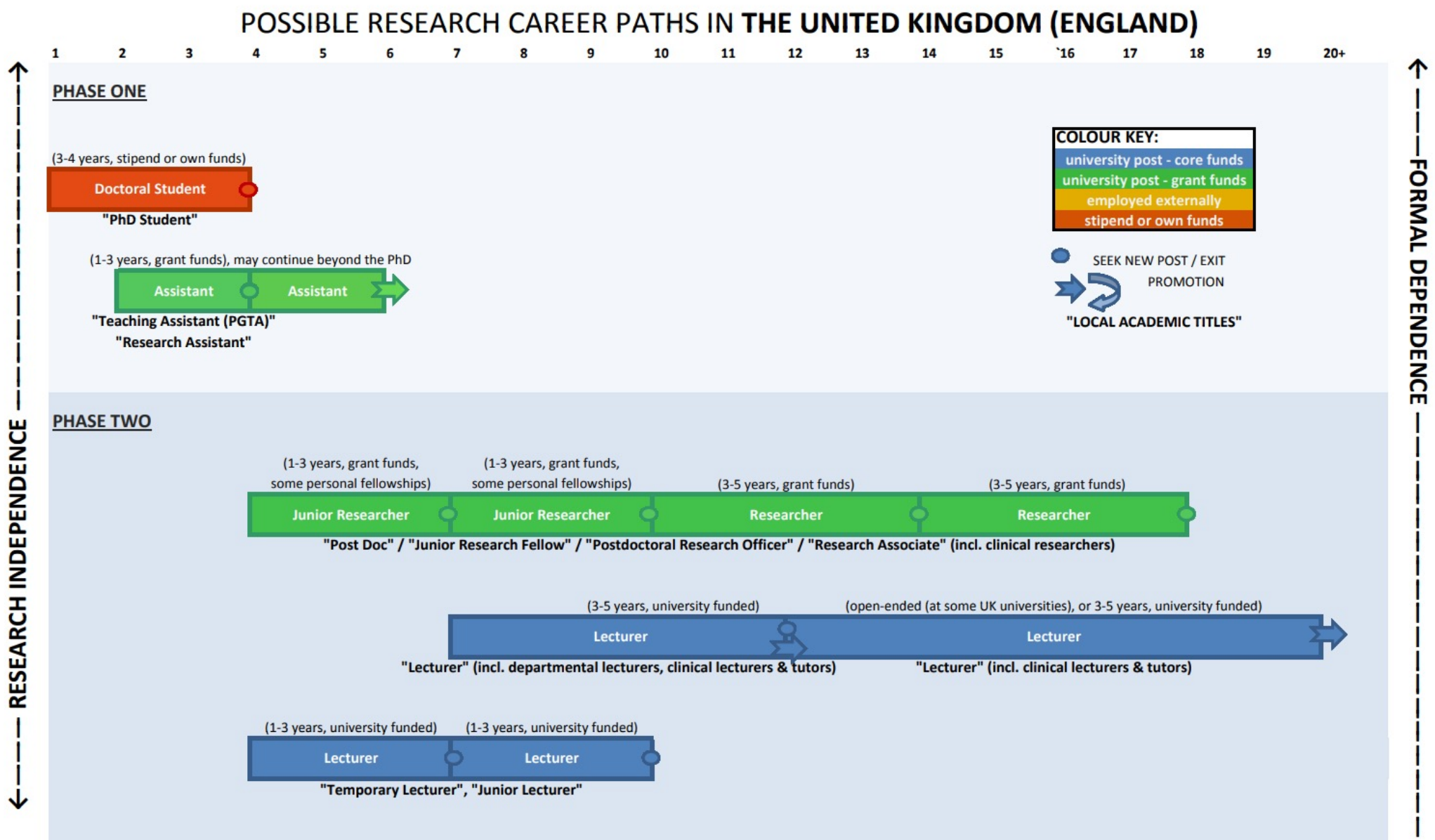
What skills are useful/required in academia?

17. Oh yeah, write tons of papers. Collaborate. Set up cool projects. Plan ahead. Be creative, have great ideas and follow them up. Science!
18. Be editor for 1 or 2 journals to increase chances for tenure
19. Review several papers a month (in most months, I receive at least 10 invitations; fewer in November, more in January)
20. Right, teaching …
21. Supervise students
22. Write a few major grant applications per year
23. Apply for positions
24. Be involved in a few large international collaborative grant applications

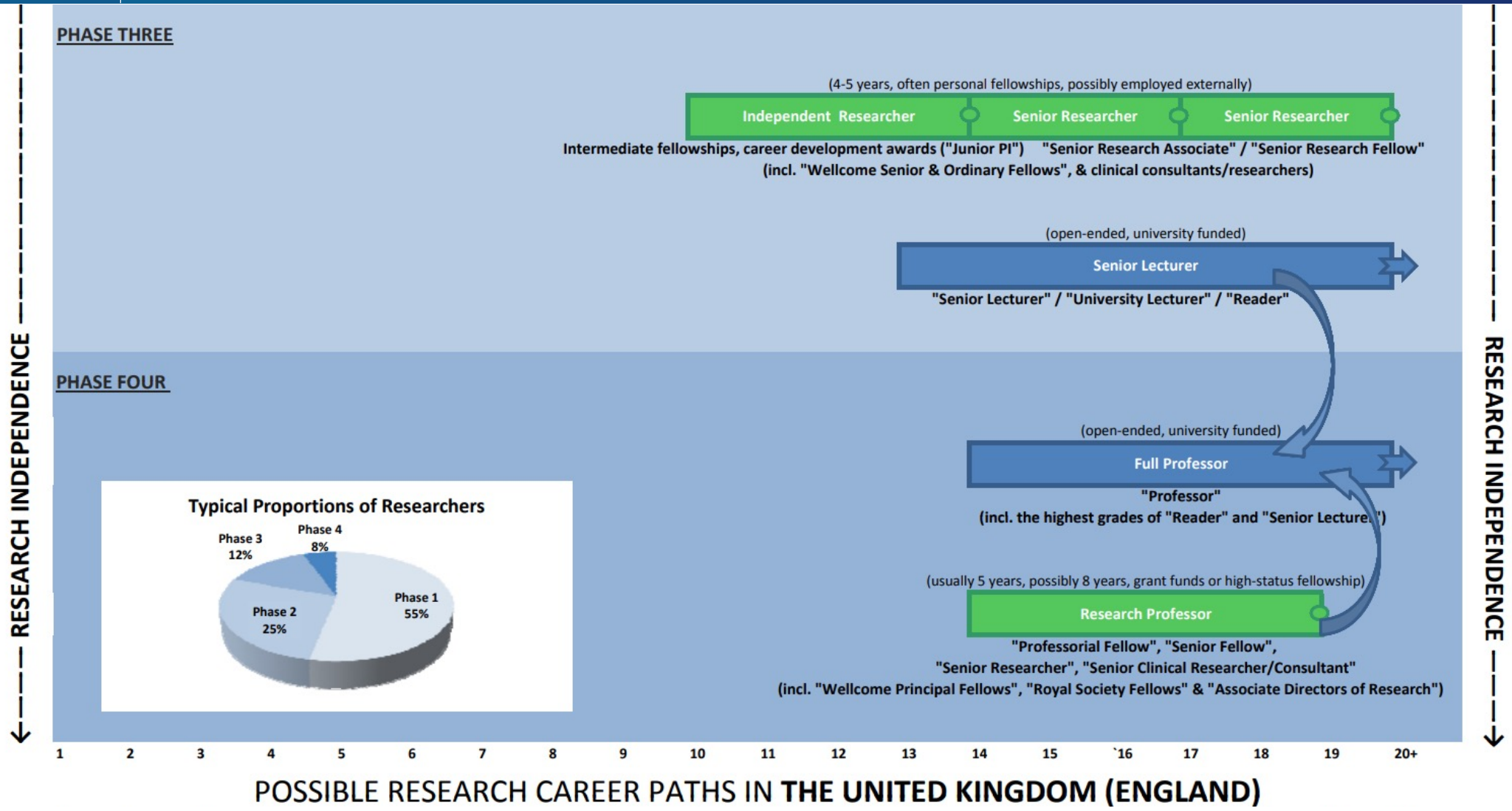
What skills are useful/required in academia?

25. Travel a lot, organize and give talks at conferences
26. Move every 2 years to another country (for me it's been 6 countries since 2005); learn the local language to have chances of getting tenure
27. Stand out as calm and collected member of the university, be helpful, unstressed, have an open ear for problems of students and co-workers ;)

Academic career stages

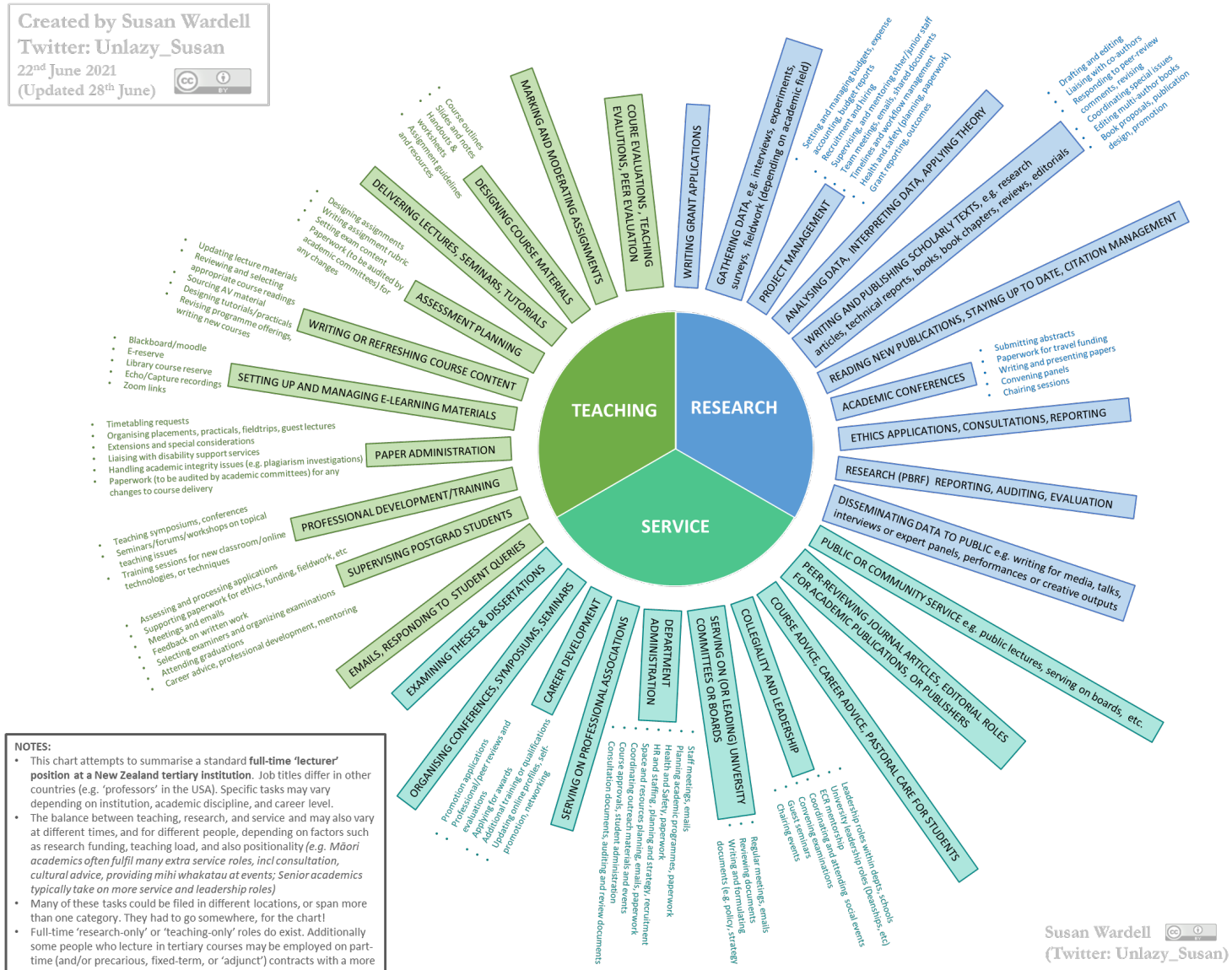


Academic career stages



What skills are useful/required in academia?

ACADEMIC LIFE: WHAT DOES A "LECTURER" DO?



NOTES:

- This chart attempts to summarise a standard **full-time 'lecturer' position at a New Zealand tertiary institution**. Job titles differ in other countries (e.g. 'professors' in the USA). Specific tasks may vary depending on institution, academic discipline, and career level.
- The balance between teaching, research, and service and may also vary at different times, and for different people, depending on factors such as research funding, teaching load, and also positionality *(e.g. Māori academics often fulfil many extra service roles, incl consultation, cultural advice, providing mihi whakatau at events; Senior academics typically take on more service and leadership roles)*
- Many of these tasks could be filed in different locations, or span more than one category. They had to go somewhere, for the chart!
- Full-time 'research-only' or 'teaching-only' roles do exist. Additionally some people who lecture in tertiary courses may be employed on part-time (and/or precarious, fixed-term, or 'adjunct') contracts with a more limited schedule of responsibilities.

What skills are useful/required in academia?

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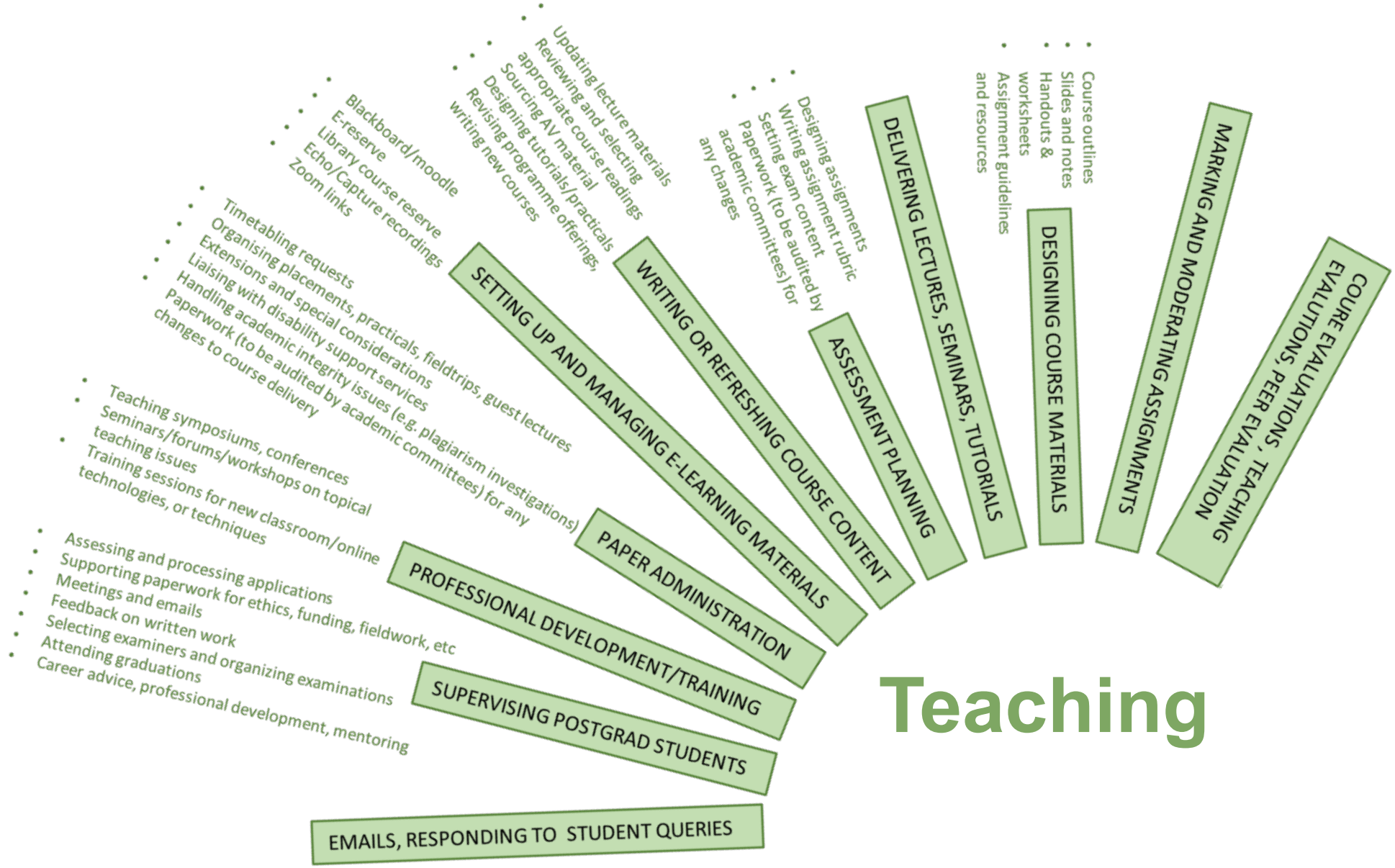

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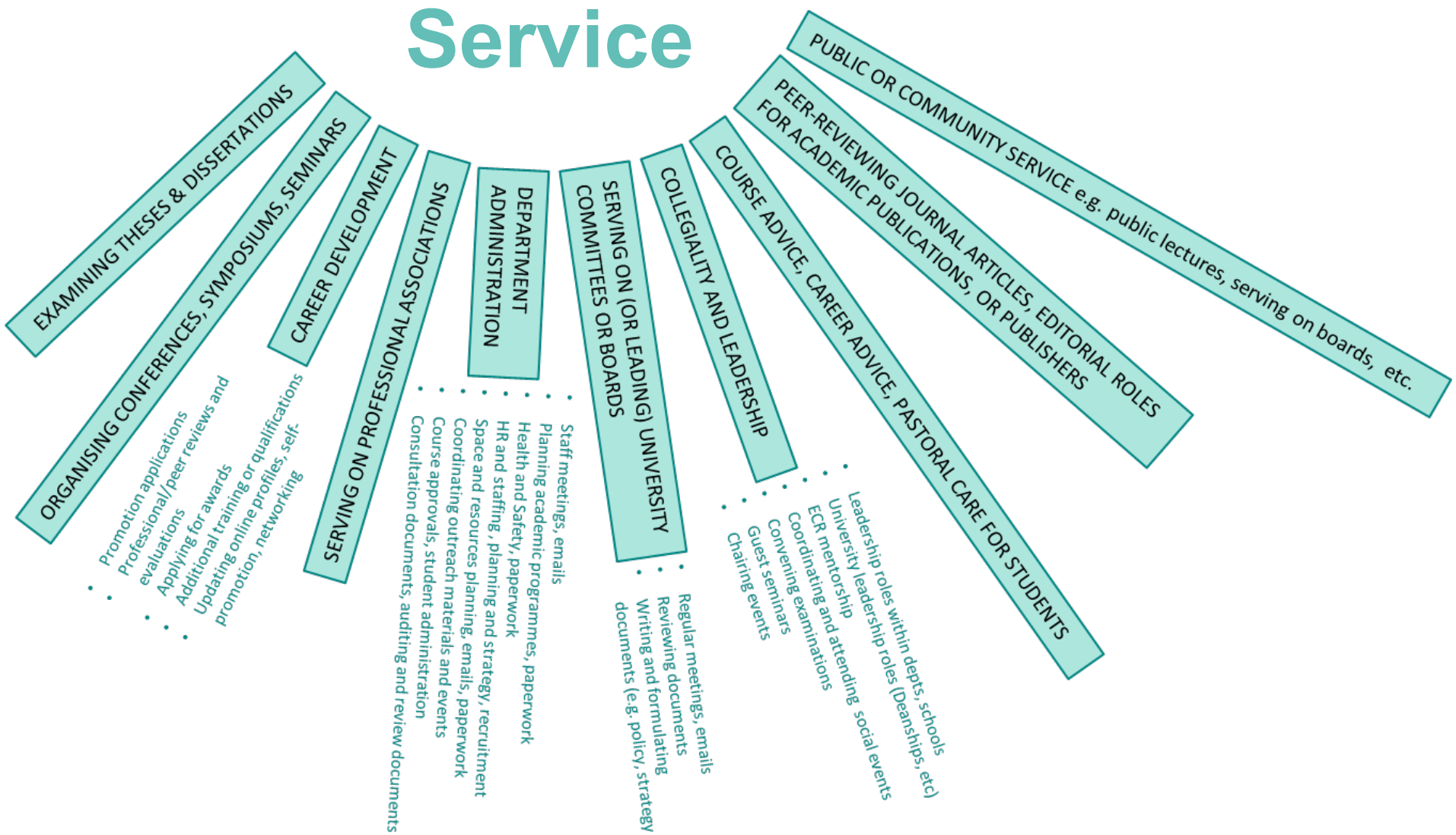


What skills are useful/required in academia?

Table 1 Faculty credentials fall into four categories

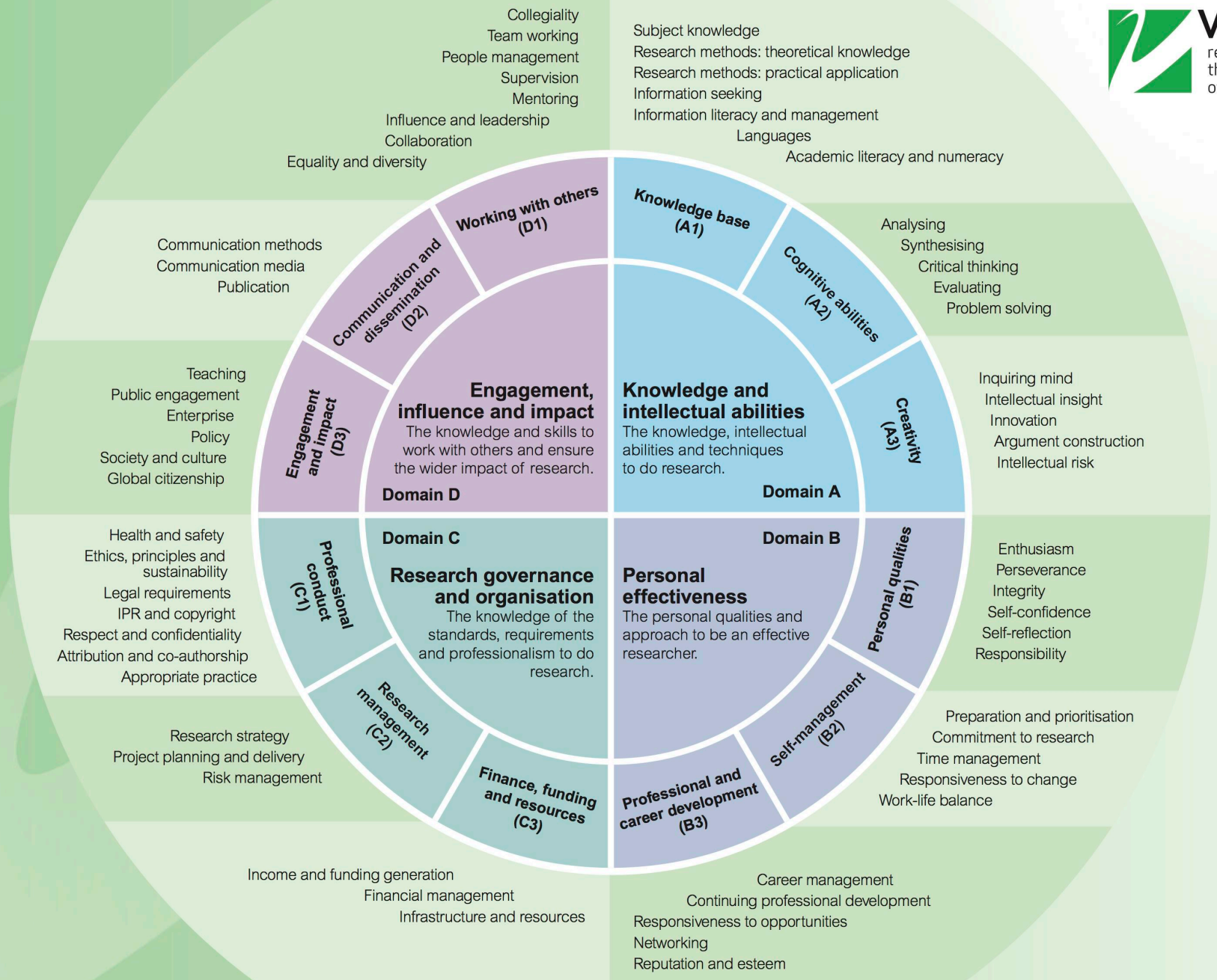
	Assistant	Associate	Full
Core competencies			
Current grant funding	1.00	1.00	1.00
Publication history	1.00	1.00	1.00
Research area	1.00	1.00	1.00
Scientific/programmatic fit	1.00	1.00	1.00
Potential research contributions	1.00	1.00	0.86
Ability to establish new techniques	0.86	0.86	0.86
General fit	0.86	0.93	1.00
Recruitability	0.86	1.00	1.00
Initial necessities			
Advisor/mentor reputation	0.93	0.64	0.50
Training institution reputation	0.86	0.64	0.57
Necessities for advancement			
National/international recognition	0.36	0.93	1.00
Regional/national recognition	0.50	0.93	0.93
Previous grant funding	0.64	1.00	1.00
Leadership abilities/potential	0.64	0.86	1.00
Unnecessary credentials			
Contribution to service mission	0.50	0.64	0.64
Contribution to teaching mission	0.57	0.64	0.64
Local/regional recognition	0.57	0.79	0.83

Credential scores followed one of four distinct trends: core competencies, initial necessities, necessities for advancement, and unnecessary credentials.

(Wright & Vanderford, 2017)

Transferable Skills

vitae
realising the potential of researchers



TRANSFERABLE SKILLS for Early-Career Researchers

Research

Citizen Science
Data analysis
Disciplinary knowledge/terminology
Ethics/integrity
Grant application writing
Interdisciplinarity
Literature use/management
Open Access publishing
Open Data management
Open Education
Open Evaluation
Open Licensing
Open Methodology
Open Source
Project/time management

Career Development

Career planning/assessment
CV writing
Interview techniques
Job searching/application
Skills documentation/verification
Skills gap identification/development

Digital

Information accessing/retrieval
Information presentation/visualisation
Information processing/exchange
Software usage/development
Programming

Communication

Academic writing
Formal correspondence
Oral presentation
Science for non-technical audiences
Science for policy making
Social media/webinar usage

Mobility

Intercultural awareness/communication
Intersectoral awareness/experience
Foreign language skills

Cognitive

Abstraction/creativity
Analysis/synthesis
Critical thinking/problem solving
Organisation/optimisation

Enterprise

Commercialisation
Entrepreneurship
Innovation/knowledge transfer
Intellectual Property Rights (IPR)
Legal/business standardisation
Patenting

Teaching & Supervision

Course development/assessment
Exam preparation/assessment
Mentoring/supervising students
Teaching and learning theories/methods

Interpersonal

Conflict management
Discipline/perseverance
Diversity awareness
Leadership/team work
Negotiation
Independence/responsibility
Networking
Rhetoric/argumentation
Stress tolerance
Taking on responsibility

eurodoc
The European Council of Doctoral Candidates and Junior Researchers

Skills

- Padlet responses

- Time management

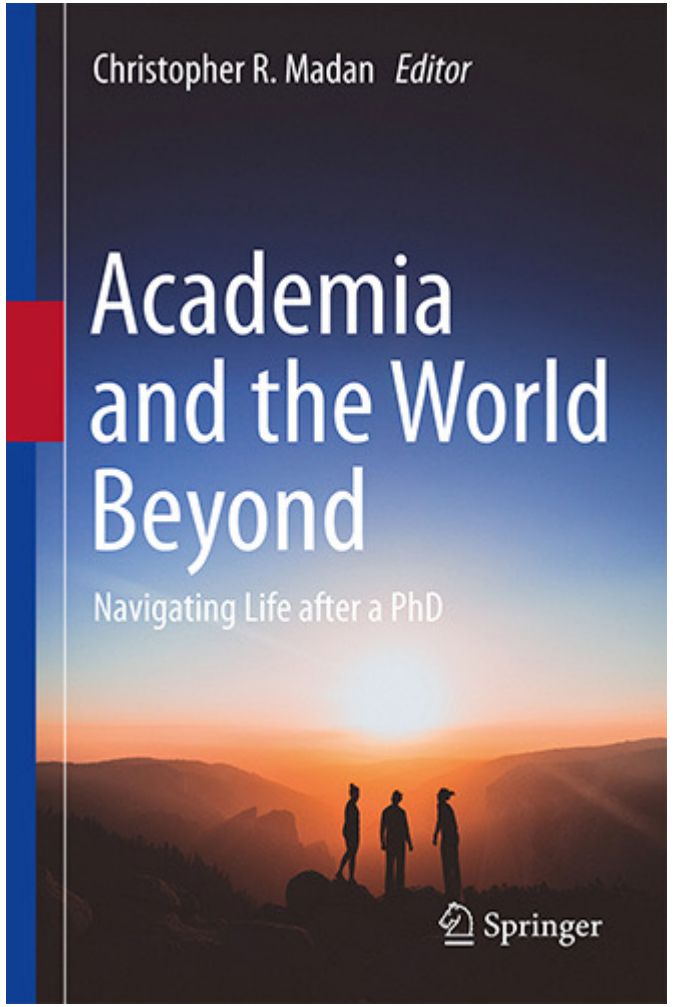
- Interview questions
  - https://uk.indeed.com/career-advice/interviewing/star-technique

Skills vs. Careers


Things People ask PhD students
What's your research on?
What's the Point of that?
What will you do after?
Are you going to be a teacher?
Did you hear that <person your age> got a job?
Did you hear they're buying a house?
What do you mean you've no money?
Can't you get a Summer job?
When are you finished your PhD?
Are you done Now?
How long can it take?
Now?
WHY ARE YOU SAD ALL THE TIME?
twisteddoodles.com

Academia and the World Beyond

- "What will you do after [a PhD]?"
  - Interviewed 22 people that completed a PhD and are now in an academic position or another career path
- Some academic, some non-academic
- Topics include career journey, skills, advice
- Published in January 2022
  - *Should have university library ebook access, will post announcement when available*



Academia and the World Beyond: Academic Careers

research-focused OR teaching-focused

research **teaching** mentorship **admin**

moving internationally **two-body problem**

when to have kids grant writing

collaborating **soft skills and technical skills**

public speaking switching to industry and back again

Academia and the World Beyond: Non-Academic Careers

government policy science communication

journal editor founder and director

hospital research coordinator marketing

data scientist industry research scientist

(social media, tech, retail sales, pharmaceuticals, government, software development, sports)

product manager business administration

scientific equipment salesperson

intellectual property lawyer journalist

Summary

- Lots of skills are associated with being successful in academia
- Lots of academic skills are useful in other settings too

- When listing your skills (for CV/interview), refer back to eurodoc list—which are you able to provide examples for?