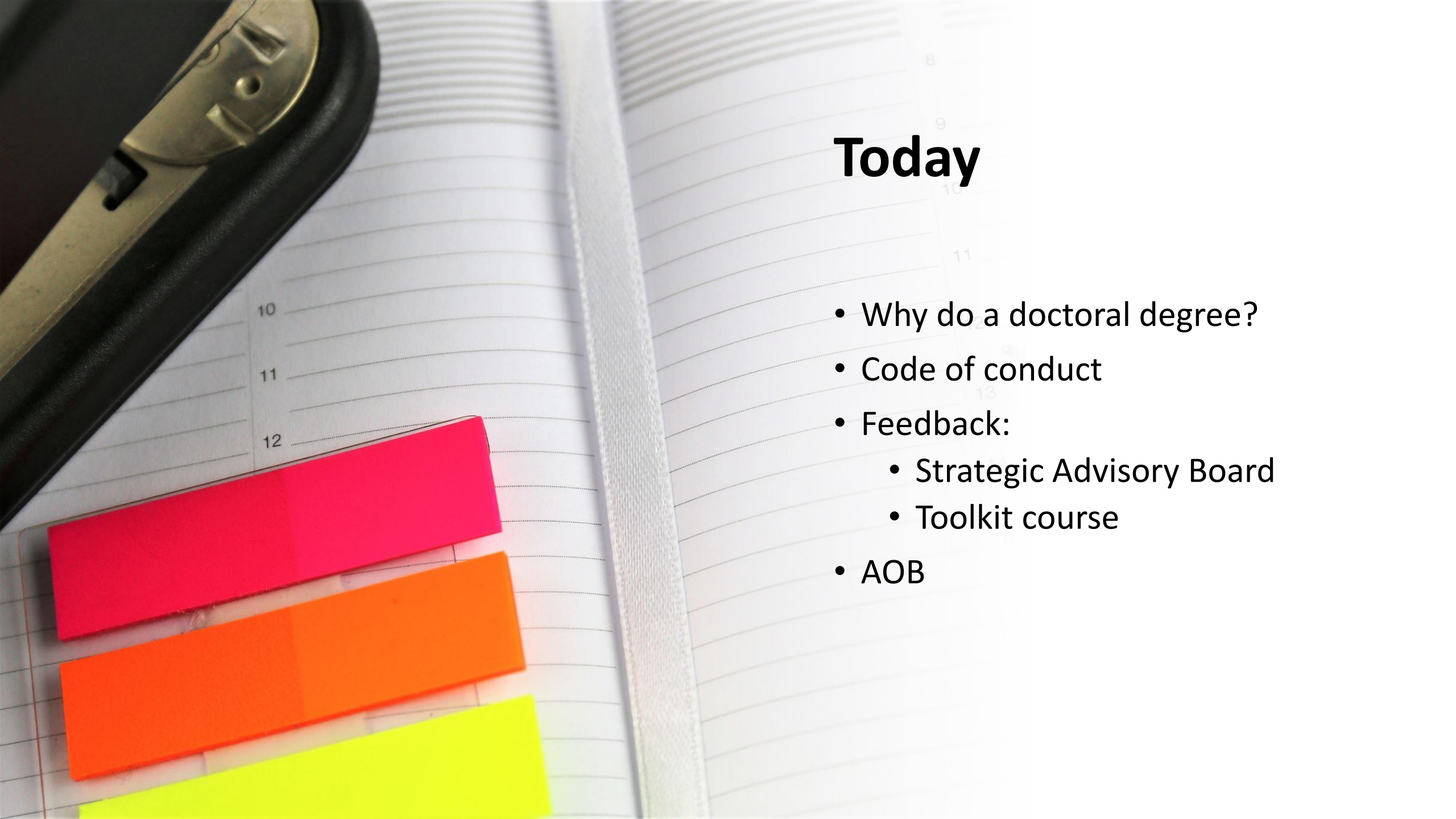


CHEM-L1000: Toolkit for Doctoral Studies

Summing-up!

Mark Hughes

4th March 2025



Today

- Why do a doctoral degree?
- Code of conduct
- Feedback:
 - Strategic Advisory Board
 - Toolkit course
- AOB

The doctoral degree

- Doctoral degrees, or doctorates, are the highest degrees that can be awarded.
- Can be academic e.g., Ph.D., D.Sc. or professional e.g., M.D., Pharm. D.
- Research-based, though may include other studies.
- The thesis or dissertation is an integral part of the degree.
- The thesis can be either **article-based** or a **monograph**. There are pros and cons to each.

The doctoral dissertation

“This must represent a significant contribution to learning, for example through the discovery of new knowledge, the connection of previously unrelated facts, the development of a new theory, or the revision of older views, and must take account of previously published work on the subject. Some Cambridge dissertations go on to form the basis of significant publications.”

What does a doctoral degree mean?

- Whilst the doctoral degree is the highest educational degree awarded it is also a job...!
- Basic education for research
- What is the content of the education?
 - Doing science
 - Experimental work, techniques
 - Communication (publications, presentations)
 - Responsible conduct



Discussion: Pros and cons

- Why obtain a doctoral degree?

- Advantages

- Drawbacks

Tutkija (tohtori), palkka

Keskimääräinen kuukausipalkka tehtävänimikkeelle tutkija (tohtori) on **4325 euroa kuukaudessa**. Katso myös eri ammattien keskimääräiset palkat sekä suurimmat ja pienimmät palkat alta.

Palkkavertailu tai palkkalaskuri on mainio työkalu, kun haluat selvittää eri ammattien palkat. Katso ajantasaiset palkkatiedot ja selvitä sopiva palkka.

TEHTÄVÄNIMIKE	KOKO TYÖKOKEMUS	TOIMIALA
Tutkija (tohtori)	Valitse	Valitse

Tyhjennä valinnat

Keskippalkka kuukaudessa

4325 €

Salary (€/month) October 2017 (regular hours and employment)

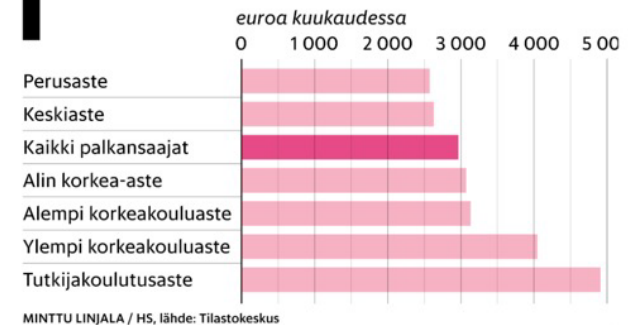
	Median age	Median salary, €	Mean, €	Change of median salary, %
All respondents	41	4 780	5 219 ± 45	0,2
Master of Science in Technology	40	4 799	5 247 ± 52	0,2
Architects	44	4 220	4 378 ± 123	0,4
MSc in natural sciences	42	4 450	4 711 ± 137	-0,8
Licentiate or doctoral degree	46	5 220	5 641 ± 137	0,4

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TALOUS

Työ

Tulot koulutuksen mukaan



Palkkatilaston mukaan koulutus kannattaa yhä

Keskimääräinen palkansaaja ansaitsi viime vuonna 2 963 euroa.

Teemu Luukka

KOKOAIKAISessa työssä oleva suomalainen ansaitsi viime vuonna keskimäärin 2 963 euroa, kun mukaan lasketaan peruspalkan lisäksi kaikki palkanlisät, ylityöt ja luontoisedut.

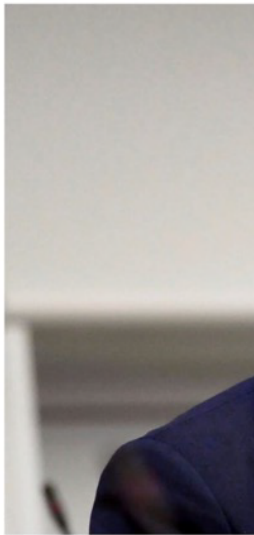
eli palkkajonon keskimääräinen luku.

Ylemmän korkeakoulututkinnon suorittaneiden mediaani-ansio nousee 4 042 euroon.

Heillä tulot vaihtelevat runsaasti. Eniten ansaitsevat terveysalan, tekniikan ja kaupallisen koulutuksen saaneet. Terveysalan koulutettujen keskimääräinen palkka on 5 480 euroa, tekniikan 4 856 euroa ja kaupallisen alan 4 813 euroa.

TILASTOKESKUS julkaisee aika ajoin myös toisenlaisia keskiar-

Rakentaminen: Bet



Maatalous- ja ympäristömini

Tiilikai hallituk

Ministeri vastaa betoniteollisuuden syytöksiin.

Teemu Luukka HS

Pros and cons

- Overqualified
- Can have a narrow focus
- Can lead to stressful personal relations
- Lots of work
- Low salary or remuneration
- Writing and reading can be stressful
- Long-term commitment
- Delayed payback
- Curiosity
- Interest
- Sense of achievement
- Variation, flexibility
- Travel, networking
- Working independently
- Interesting, fulfilling jobs
- Working for yourself
- Valuable work content in itself

Top skills on the job market

How to use the degree as leverage for your next job? Assets:

- Ability to think critically
- Strong analytical skills
- Ability to communicate clearly; good language skills
- Able to solve complex problems
- Ability to network, work collaboratively, teamwork, socially competent
- Ethical values

Transferable skills

- Communication – Toolkit seminar - group
- Meetings, conferences, workshops
- Teamwork, collaboration
- Language – are you able to write an article from start to finish? Writing courses –
 - *CHEM-E2165 - Computer Aided Visualization and Scientific Presentation*
 - *Writing and communication courses.*

Article-based thesis or monograph?

Monograph

- A book! Your own work
- Not dependent on the peer-review process - lengthy
- More freedom with timeline

Article-based dissertation

- Concise, easier to read!
- Continuous 'quality control' of peer-reviewed articles
- You get published!
- Difficult for evaluators & opponent to criticize peer-reviewed articles

Monograph

- A lot of writing – too much to read!
- No 'quality control' from published articles

Article-based dissertation

- Does not give the 'depth' of a monograph
- Lengthy timeline – depends on the peer-review process (3-12 months review process?!), or stress to meet a fixed timeline
- Problematic if manuscript is rejected
- Must identify clearly your contribution

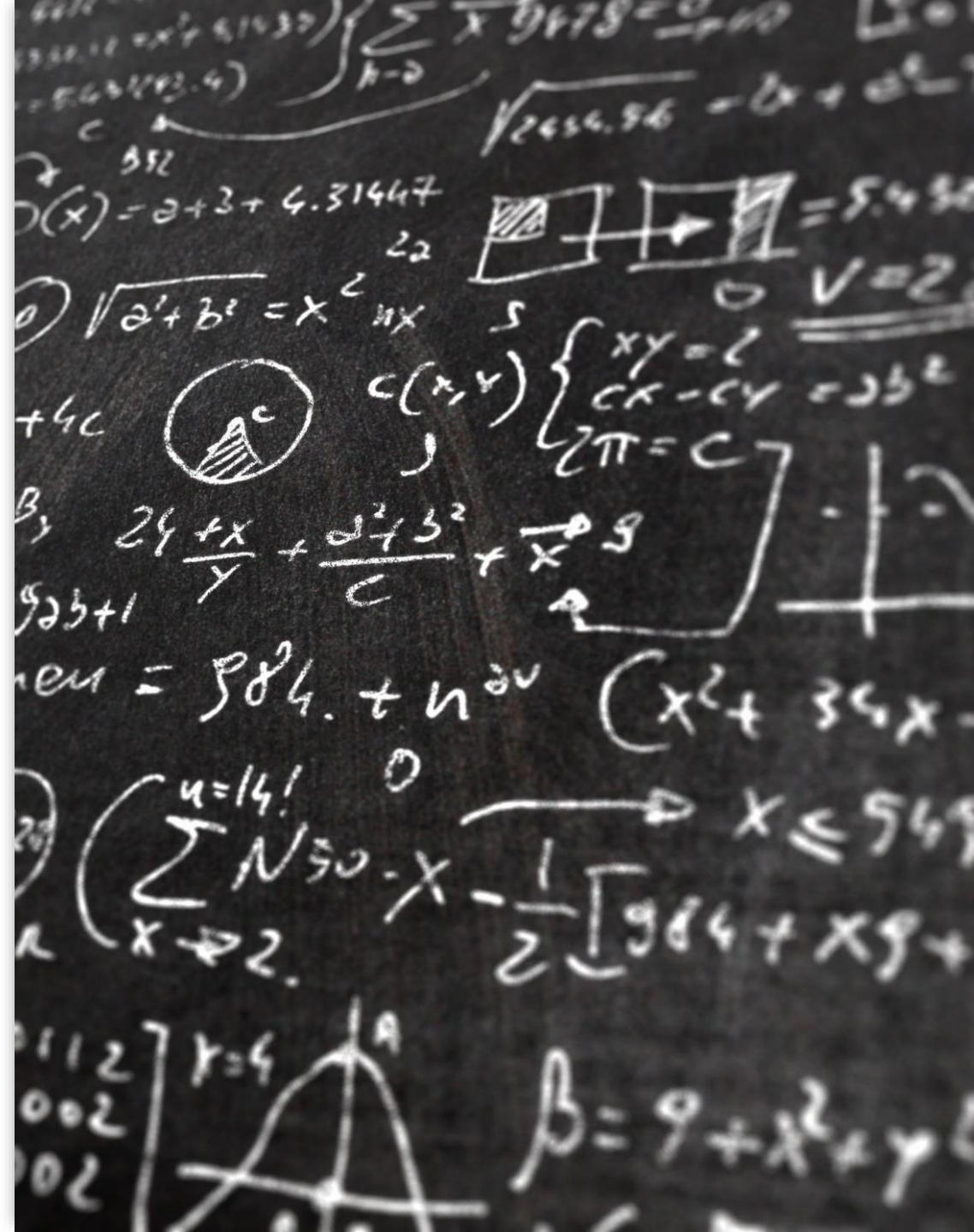


The thesis in practice.....

- NEW scientific findings - new scientific understanding
- Duration: nominally 4 years, in practice tends to be longer
- In practice 3-4 articles (Start to write as early as possible!)
- A monograph is an alternative
- Papers can be shared
- Clear description of contributions for each paper!
- Conference papers, that are not peer-reviewed, cannot be included
- Reviews articles not allowed
- Responsible conduct in research
- 40 credits of theoretical studies

The “summary” part of the thesis

- Synthesizes the work that you have carried out
 - Remember it is *based-on* the articles, so should not simply restate their contents
- Importantly, to put the work into context
- Should provide a clear ‘red thread’
 - Important for the review
- Demonstration of your maturity as a scientist
- Your text, your view of the findings of the work – your contribution
- Should be concise (generally 40-60 pages)
- Can include additional results not presented in the articles



Other points

- A researcher's life can be a bit of rollercoaster! New demands, constantly learning something new, things go wrong, pressure from deadlines...
- Important to find a work-life balance: rest and reach out for help/advice at an early-stage
- Work healthcare, wellbeing pages <https://www.aalto.fi/en/doctoral-education/doctoral-student-wellbeing-and-support>
- The publishing process can take (a lot of) time and can be really stressful
- Networking is important!
- Conducting a doctoral degree is a marathon, not a sprint!

Other points

- Beware of imposter syndrome! Don't forget you are clever and well-educated, but disappointments and setbacks can lead to negative feelings and emotions.
- To sum up, the doctoral degree is a kind of 'driving license' for a professional researcher career but people can end-up in various positions and roles.

Multi-, inter-, trans-disciplinarity

Many of today's challenges can only be solved with multi-, inter- and trans-disciplinary approaches involving many and varied stakeholders. Being able to operate in this way is advantageous – not always a skill that is learnt at doctoral level

The current issue and full text archive of this journal is available on Emerald Insight at:
<https://www.emerald.com/insight/1467-6370.htm>

IJSHE
23,7

1482

Received 15 June 2021
Revised 3 October 2021
7 December 2021
4 February 2022
Accepted 8 February 2022

Challenge-based, interdisciplinary learning for sustainability in doctoral education

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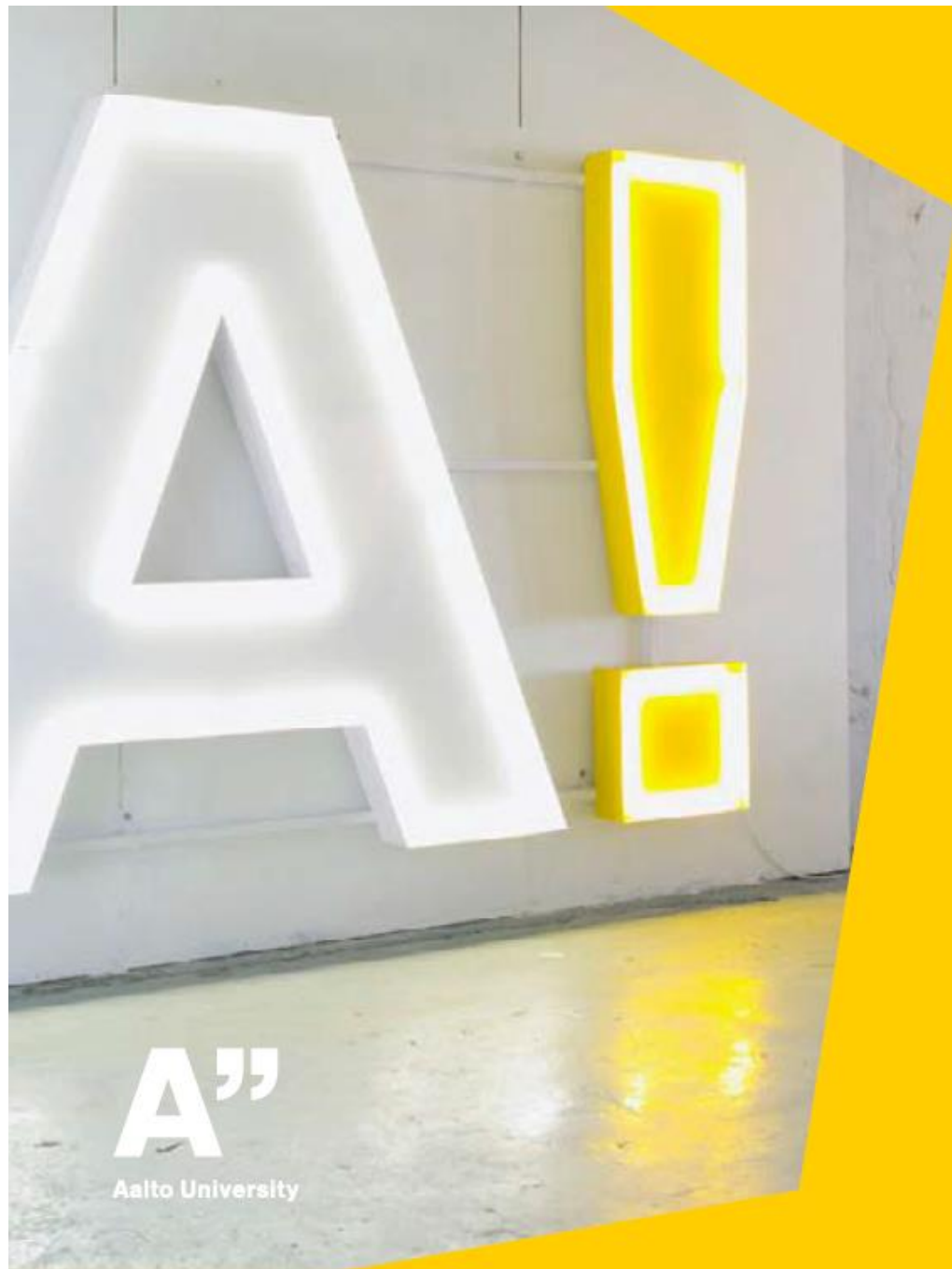
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<https://www.emerald.com/insight/content/doi/10.1108/IJSHE-06-2021-0232/full/pdf?title=challenge-based-interdisciplinary-learning-for-sustainability-in-doctoral-education>



Aalto University

*Code of
Conduct*



Aalto University

Code of Conduct

- Do the web-course! – Go to MyCourses : [*Aalto University Code of Conduct e-learning for employees*](#)

Ethical channel

- Aalto University and its subsidiaries have an ethical channel where staff, students and other members of the university community as well as stakeholders may report any misconduct they perceive.
- <https://www.aalto.fi/en/aalto-university/ethical-channel>



The Finnish National Board on Research Integrity TENK, appointed by the Ministry of Education and Culture, promotes the responsible conduct of research, prevents research misconduct, promotes discussion and spreads information on research integrity in Finland.



The Finnish National Board on Research Integrity TENK has been appointed

The Ministry of Education and Culture has appointed the Finnish National Board on Research Integrity TENK for the term of 2025-2027.



Research Integrity Barometer 2023 highlights the research community's commitment to research integrity

The Finnish Research Integrity Barometer 2023 indicates that competition for resources is a cause of concern for the research community.



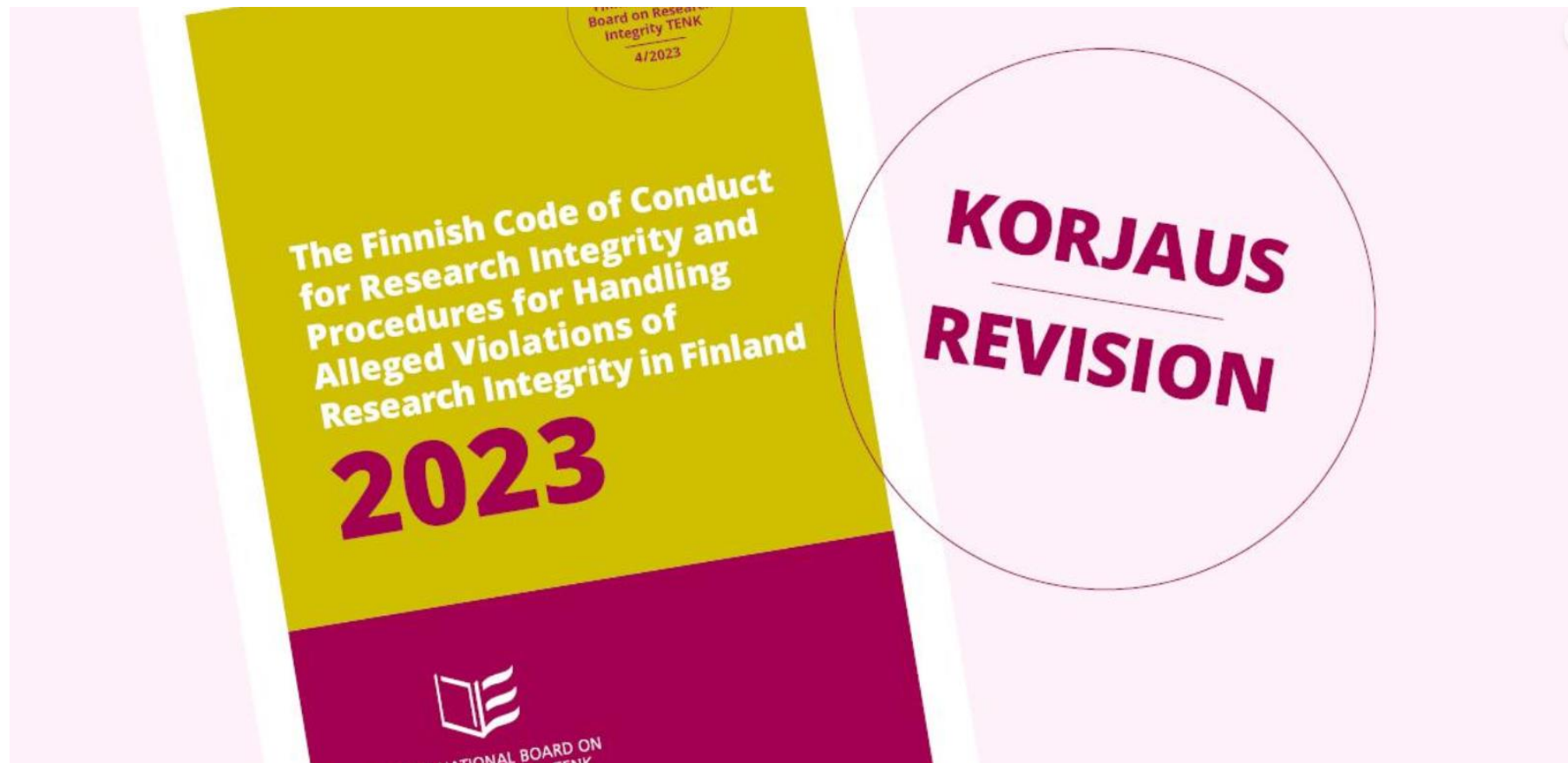
Revisions to English Translation of Finnish Code of Conduct for Research Integrity

The English translation of the Finnish Code of Conduct for Research Integrity guidelines has been refined. The purpose of the corrections is to increase the unambiguity of the text.



New teaching material to support the RI guidelines

TENK has released a new video for educational and information purposes. The video illustrates the importance of research integrity (RI), which consists of good research practices.



<https://tenk.fi/en/news/revisions-english-translation-finnish-code-conduct-research-integrity>

- Handling of misconduct, violation of research integrity guidelines, at Aalto University
- <https://www.aalto.fi/en/services/handling-of-misconduct-violation-of-research-integrity-guidelines-at-aalto-university>

Authorship

https://tenk.fi/sites/tenk.fi/files/TENK_suositus_tekijyys.pdf



Equality, Diversity and Inclusion (EDI)

- <https://www.aalto.fi/en/equality-diversity-and-inclusion-at-aalto/edi-learning-hub>

Advisory group!

- Remember to arrange and to organize your advisory group meetings!!
Suomeksi seurantaryhmä
- <https://www.aalto.fi/en/programmes/aalto-doctoral-programme-in-chemical-engineering/advisory-group-chem>

Developing doctoral education at CHEM

Summary of key observations by the SAB

OBSERVATIONS

1. Very high quality of doctoral education in general.
2. Long duration of the doctoral degree is a central issue; there is no strict rule for its duration.
3. Criteria involved in the doctoral degree process vary, with research fields or even projects and professors which effects graduation time, publication and general requirements.
4. Established "good practices" and mechanisms in place, but no general and strict rules. Practices are not sufficiently clear to all doctoral students (health-check, buddy system, introduction procedures, safety instruction, papers for thesis vs. monographs...).
5. Only a limited number of master courses for students who continue to doctoral studies.
6. There is a lack of relevant doctoral level courses.
7. There is an academic doctoral coordinator who is known to most students, though lacks general visibility and recognition.

Toolkit course?

- What was good?
- What was bad?
- What is missing?
- What was irrelevant?!
- Other suggestions