



Career development through competences

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All my training supports are published in OA on the Open Repository of the University of Liege : <http://orbi.uliege.be>

Objectives

Keys to success in a PhD:

- Know about competences, roles and actions developed during your PhD
- Know about researcher's professional attitude : project management, Ethics, Open Science
- Develop efficient collaboration in your research environment (supervisor, colleagues)



Know about competences, roles and actions developed during your PhD



Exercise :

1. All together : Describe the image.
2. Individually : Appropriate the image. What does it represent for you? How can you relate it to your PhD experience?
3. In small groups : Share your personal interpretation, then choose a title for the image, knowing that the participants will be requested to vote one. A rapporteur will introduce the title and explain it to the other groups.
4. In small groups : Give 3 arguments in favor of another title than yours.
5. Individually : vote for « THE titre ». Rules : you cannot vote for only one title, but not for the title you suggested (step 3) or defended (step 4).

Giving feedback,

Provide the others constructive elements that allow them to develop a positive attitude for growing



Be factual
Be here and now
Adapt to situation
Adapt speech to content
Avoid pitfalls

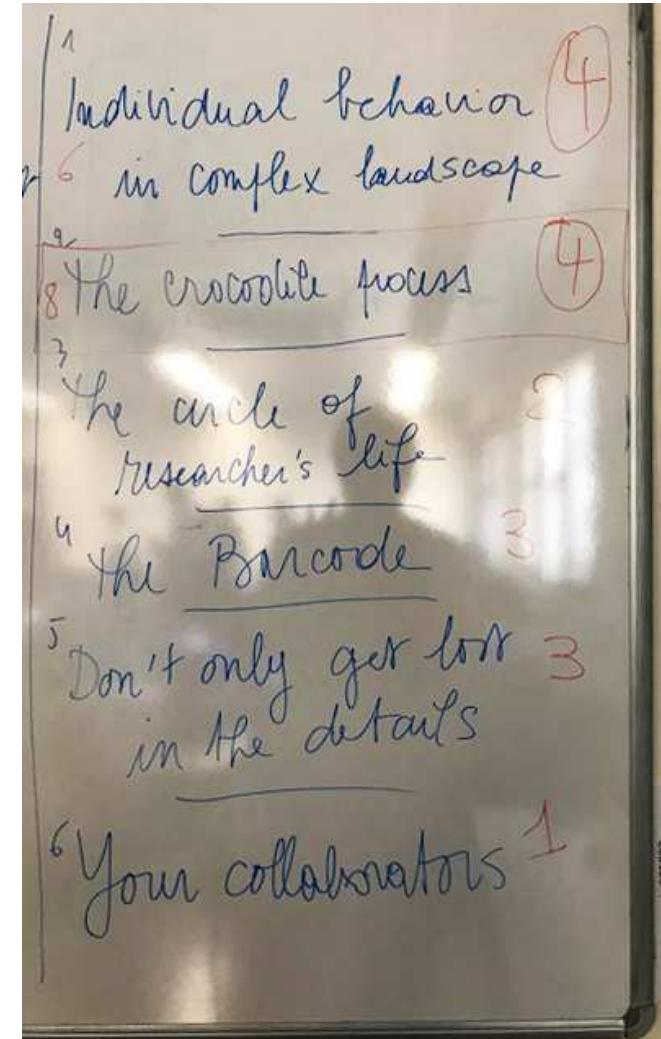
Receiving feedback,

Be open to criticism and succeed in dissociating your identity from your professional behavior to eliminate any susceptibility

- Be confident
- Listen to the end
- Take your time
- Ask for explanations
- Ask for advices fo progress

Titles

1. Individual behaviour in a complex landscape
2. The crocodile process
3. The circle of researcher's life
4. The Barcode
5. Don't only get lost in the details
6. Yours collaborators



Verbs

Activity	Verbs
All together : Describe the image.	Watch, wondering about, observe, analyse, Listen to the others, speak
Individually : Appropriate the image. What does it represent for you? How can you relate it to your PhD experience?	Associate, interpret, reflect, project, appropriate, explore,
In small groups : Share your personal interpretation, then choose a title for the image. A rapporteur will introduce the title and explain it to the other groups.	Share, express, communicate, explain. Adapt, exchange, relate, discuss, agree, conclude, collaborate, communicate, delegate, be confident
In small groups : Give 3 arguments in favor of another title than yours.	Criticise, argue, communicate, positivate, sell, defend, convince
Individually : vote for « THE titre ».	Choose, decide, agree

Classification of verbs

Individually	Collectively	Trainer's action
Observe, analyse, associate, interpret, project, explore, listen	Share a common task	Write, ask for clarification, stimulate each participant
Share, explain, formulate, appropriate, agree	Exchange, decide, delegate, be confident	Give rules, delegate, aware of group's dynamic
Analyse, compare, interpret, imagine	Reflect, discuss, criticise, produce, delegate	Analyse, make links
Choose, vote, affirm	Present, argue , argumenter	Give feedback, conclude

Competence,

is a combination of knowledge and skills



“A cluster of sufficient abilities, knowledge, and skills that enable a person to act effectively in wide variety of situations. Because each level of responsibility has its own requirements, competence can occur in any period of a person's life or at any stage of his or her career.”

Researchers' competences

Individual

- Intellectual abilities
- Personal efficiency

Collective

- Collective intelligence ($1+1 > 2$)
- Relational

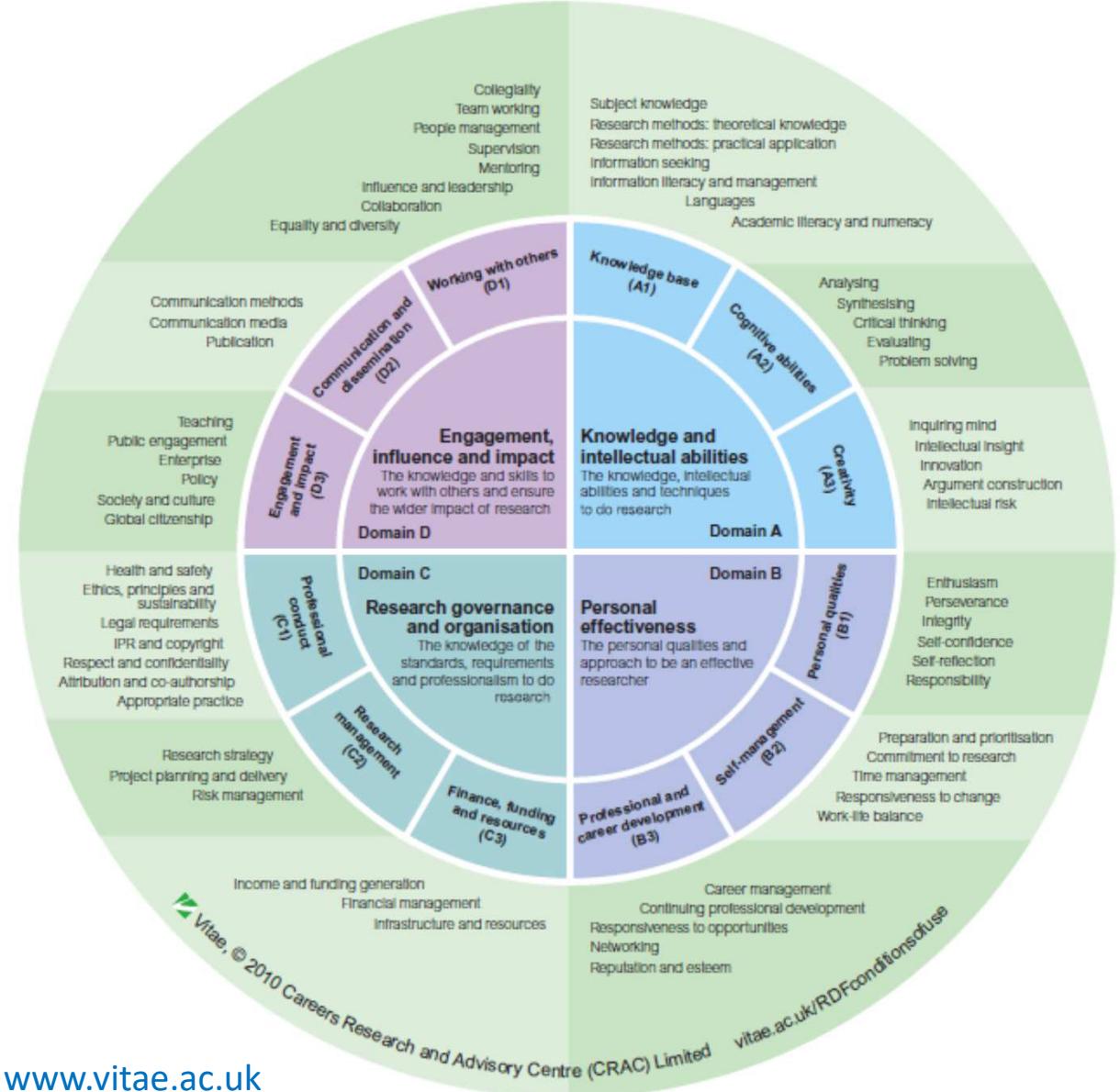
Organisational

- Project management
- Stakeholders management

Vitae's RDF...

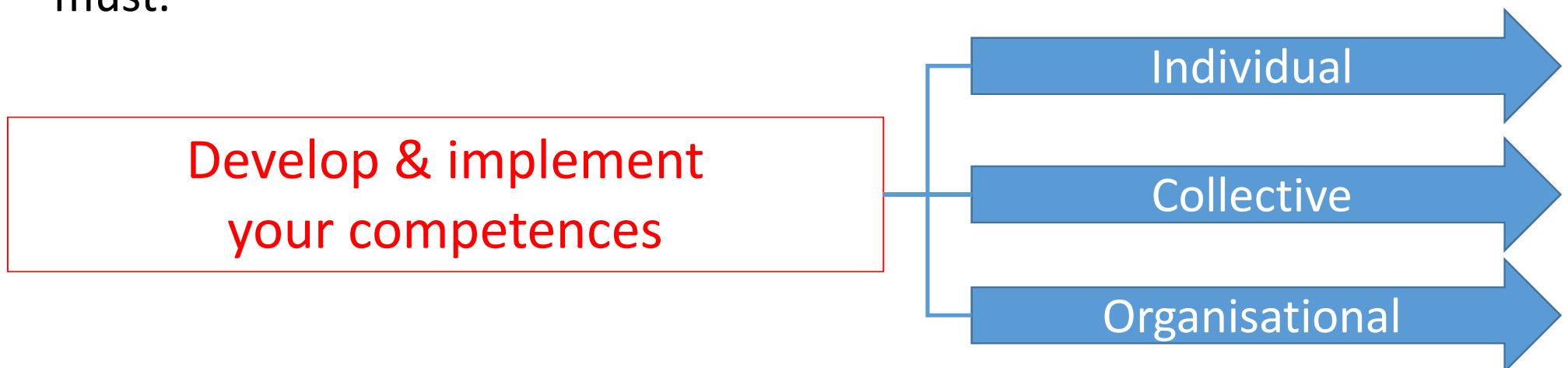
The Vitae's Researcher Development Framework circle is « the » reference.

Used with a competence analysis tool, it helps in defining which training you need



Summary

- Doctoral activities are multiple and developed in different contexts.
- Competences are multiple and complex.
- Doing a Phd is being trained to research by research.
- Recognising your competences and developing the weakest points is a must.



About the image

The drawing was done by Laura Tregellas, from a collective of adults living with learning and physical difficulties who require varying levels of support (Arthouse Meath, <https://arthouseunlimited.org/artists/laura-tregellas>). Here is what she wrote:

Have fun and make changes in your life



I really enjoy coming here as we all work together. I drew the elephant design. It took me a while to draw it but I got there, it was hard to get the shape.

Even with a disability you should try and do what you want to do – go shopping, be with friends and have a drink!

Laura Tregellas



Professional attitude



Manage your thesis as a project

Doing a PhD...

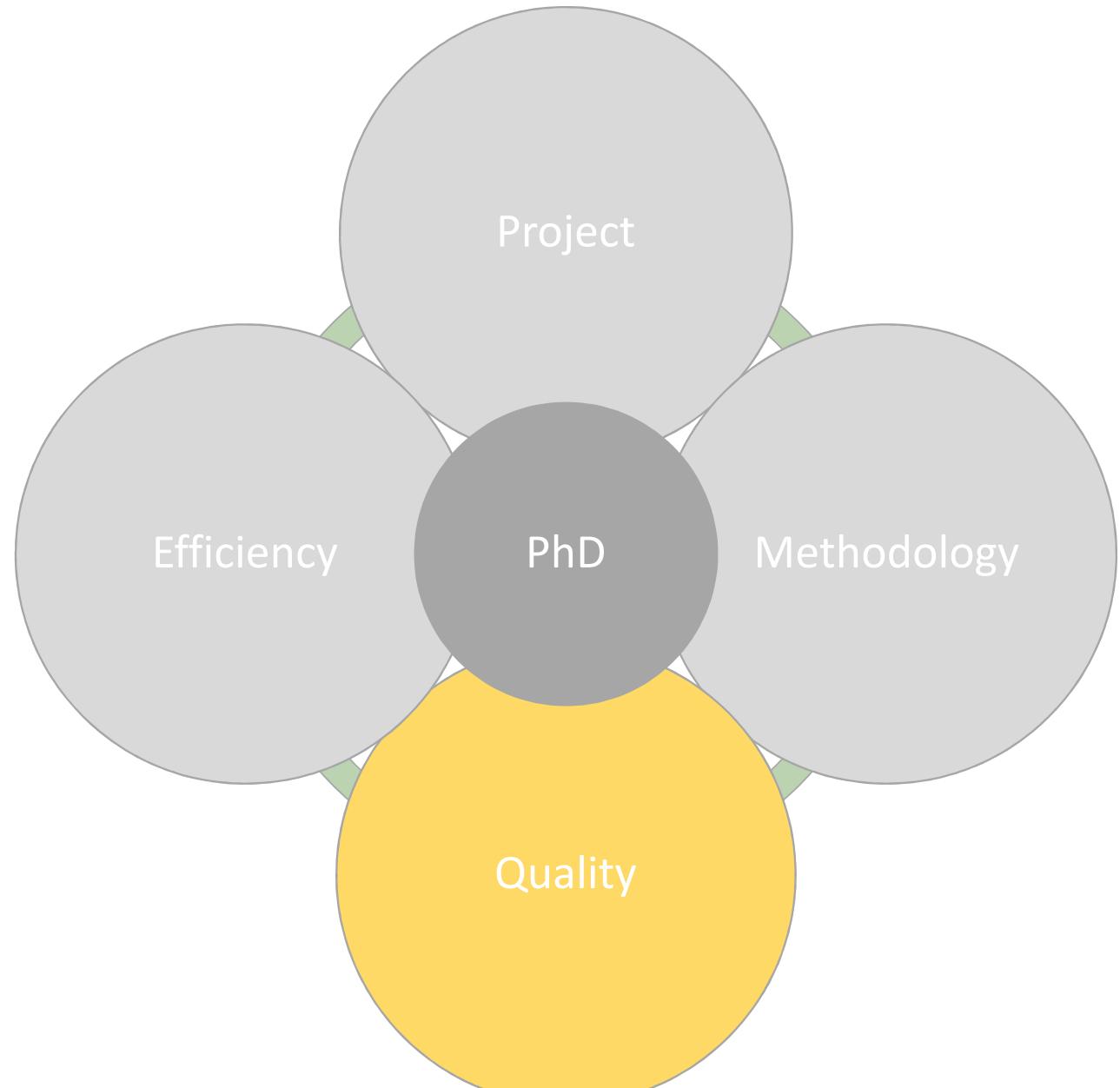


Quality...

What is a quality research?

(Said by the participants):

- Has a clear methodology
- Is reproducible
- Takes literature into account
- Is Accessible to others (scientific community, students)
- Anticipate next steps (new knowledge, innovation, application)
- Is coherent
- Is organised
- Is performed honestly

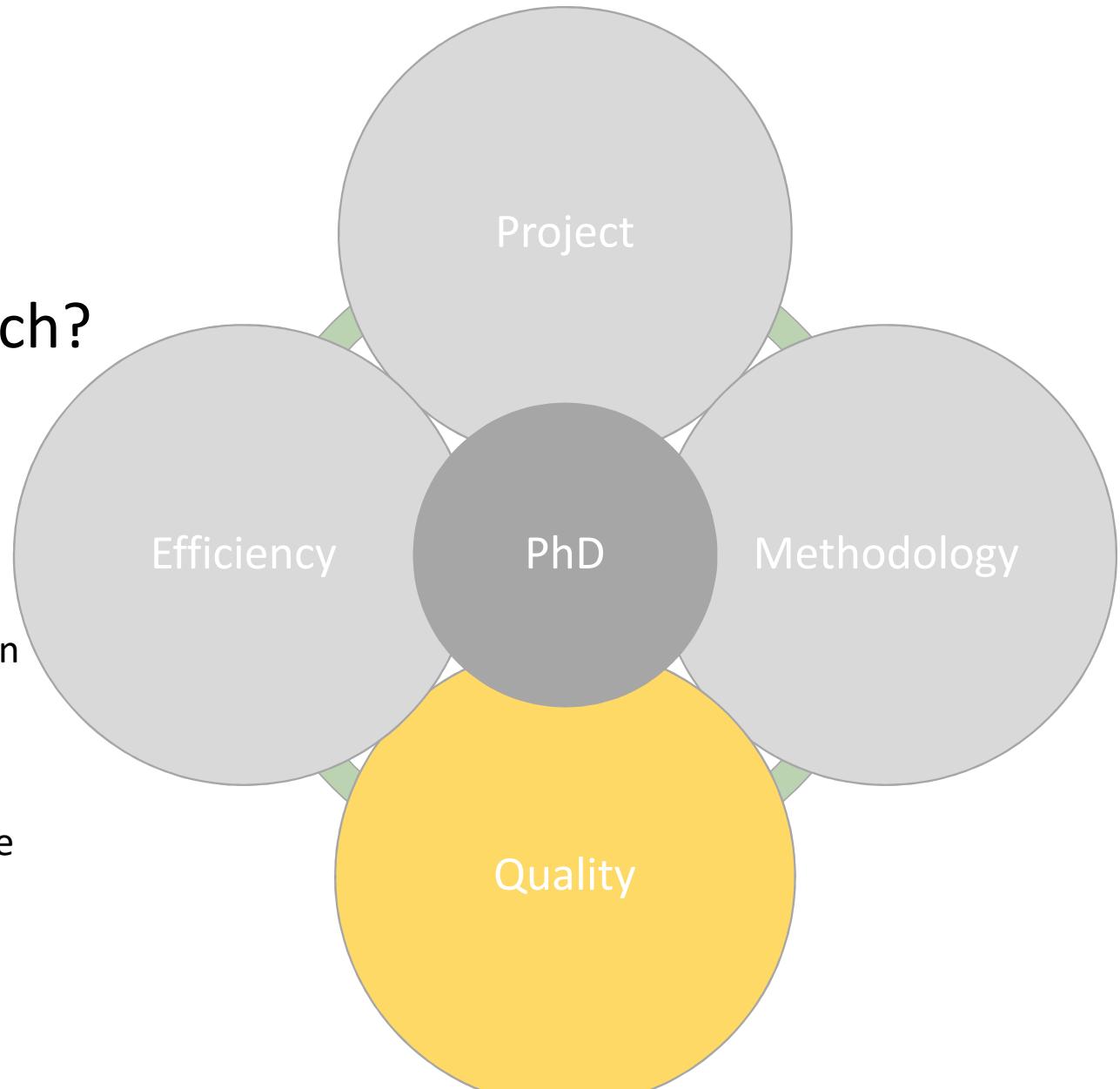


Quality...

What is a quality research?

A project that is mastered from A to Z:

- State of the art and research question
- Detailed work plan with chronogram
- Recording of experiences / thoughts
- Moments for reflection and exchange
- Professional analysis of results
- Productions (results, publications)



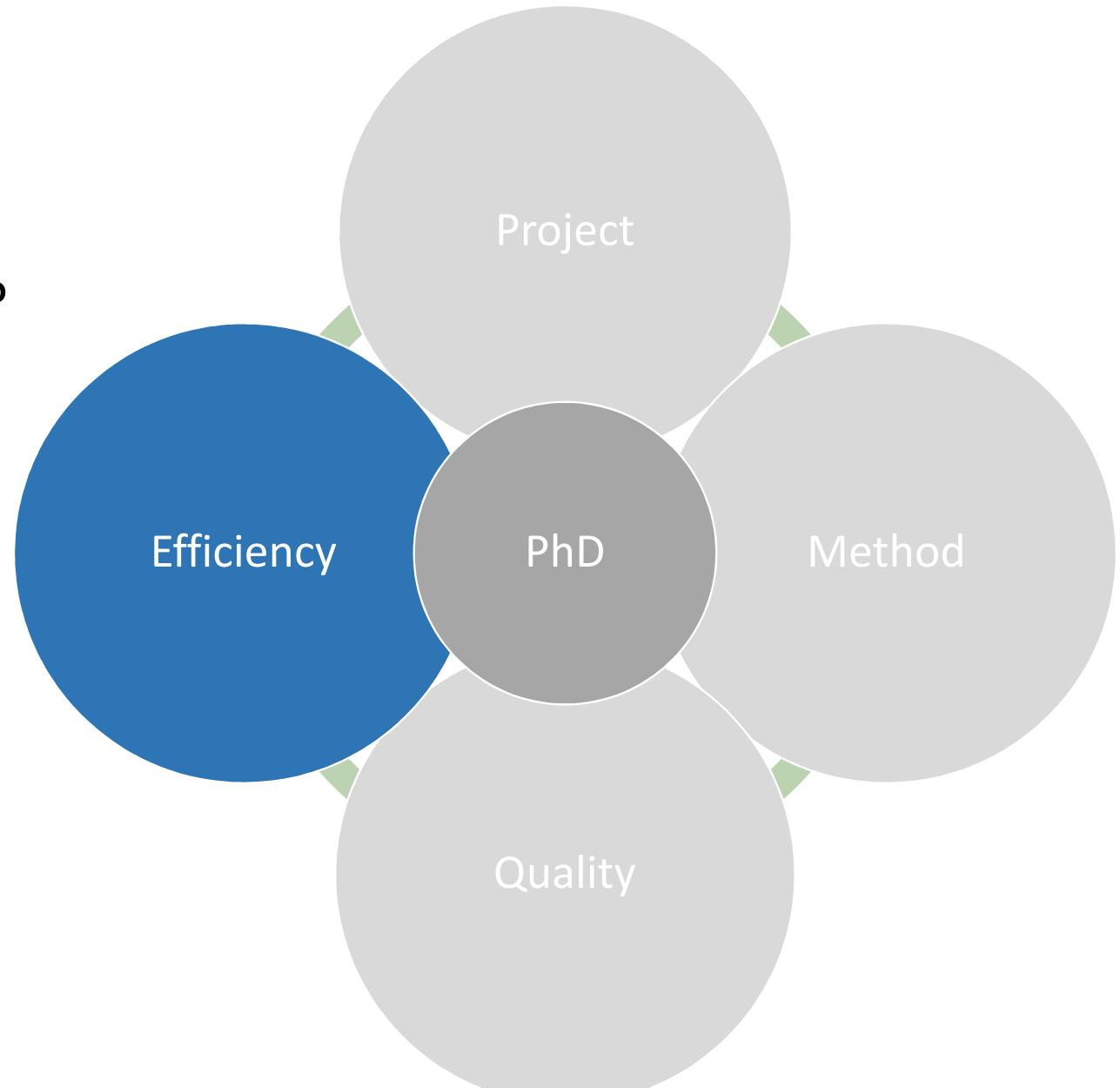
Efficiency ...

What is an efficient project?

Efficiency vs quality ?

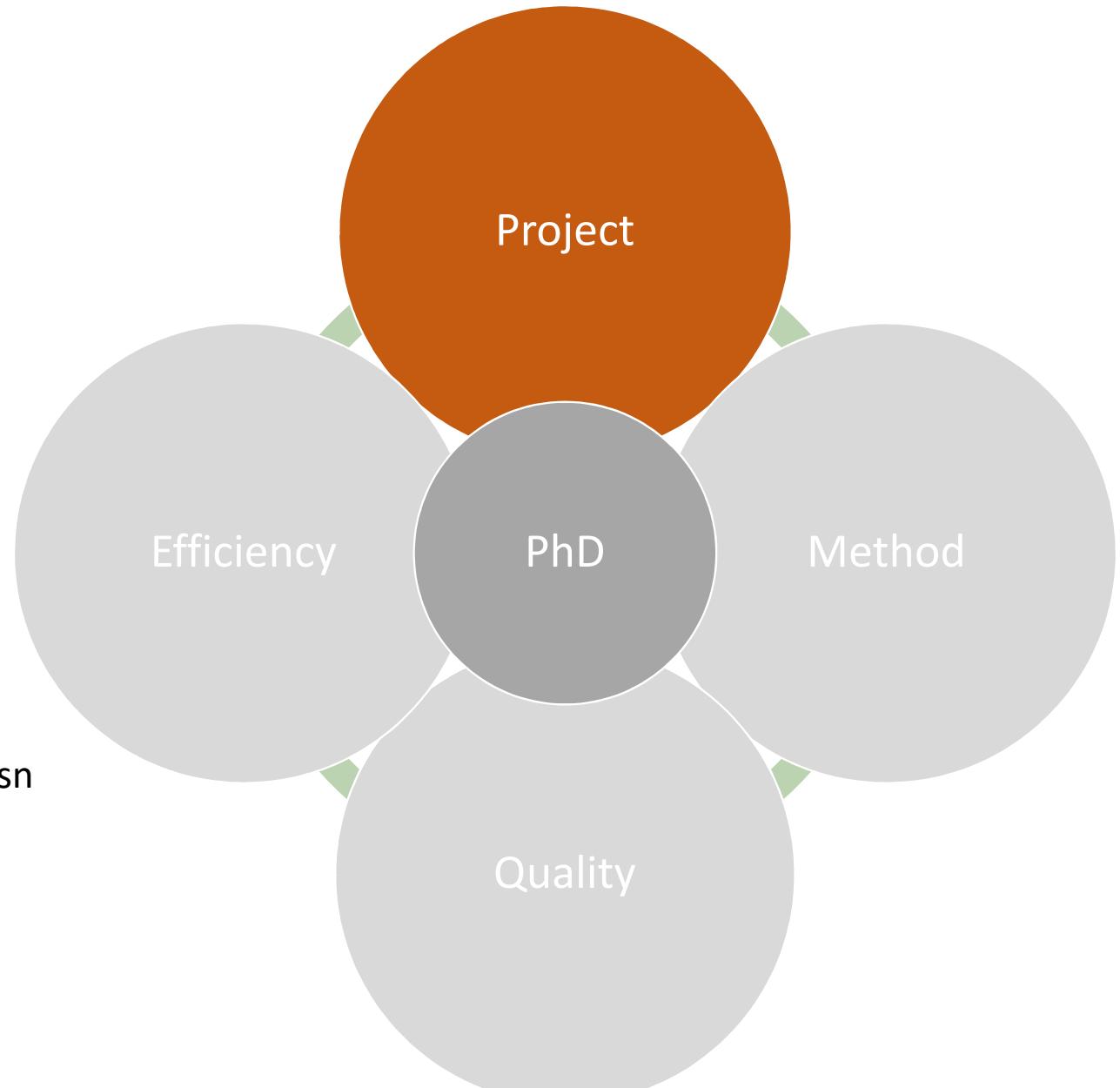
An efficient research is

- conducted **optimally**
- manage risks
- meets its objectives
- opens new horizons



Research Project...

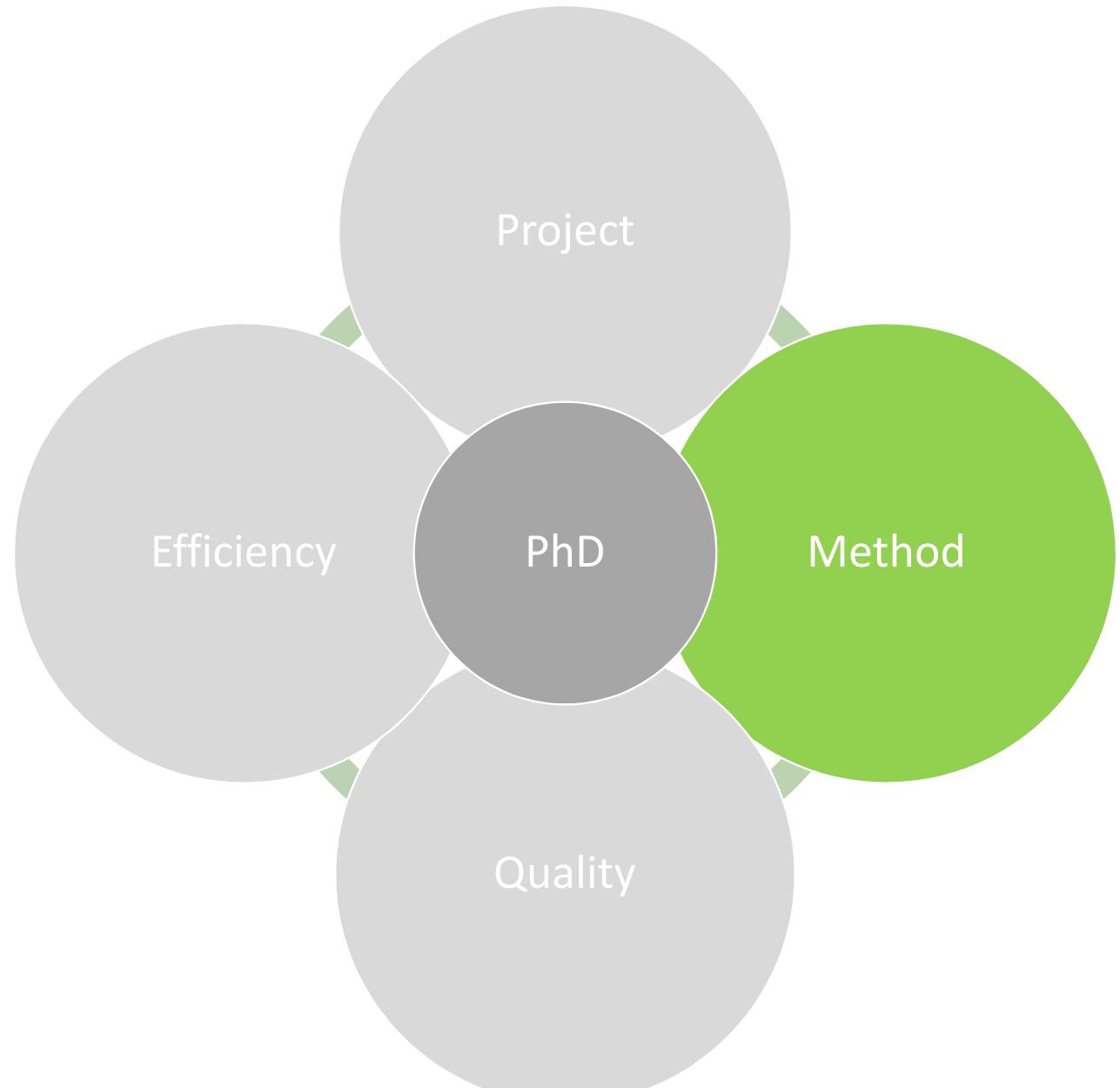
- State of the art
- Research question
- Hypothesis
- Méthod
- *Risks and constraints*
- *Ethics, Integrity, Open Science*
- *Chronogram (incl. publications)*
- Data and results
- Analysis, interpretation, conclusiosn
- Publication (incl.OA)
- Perspectives
- Bibliography



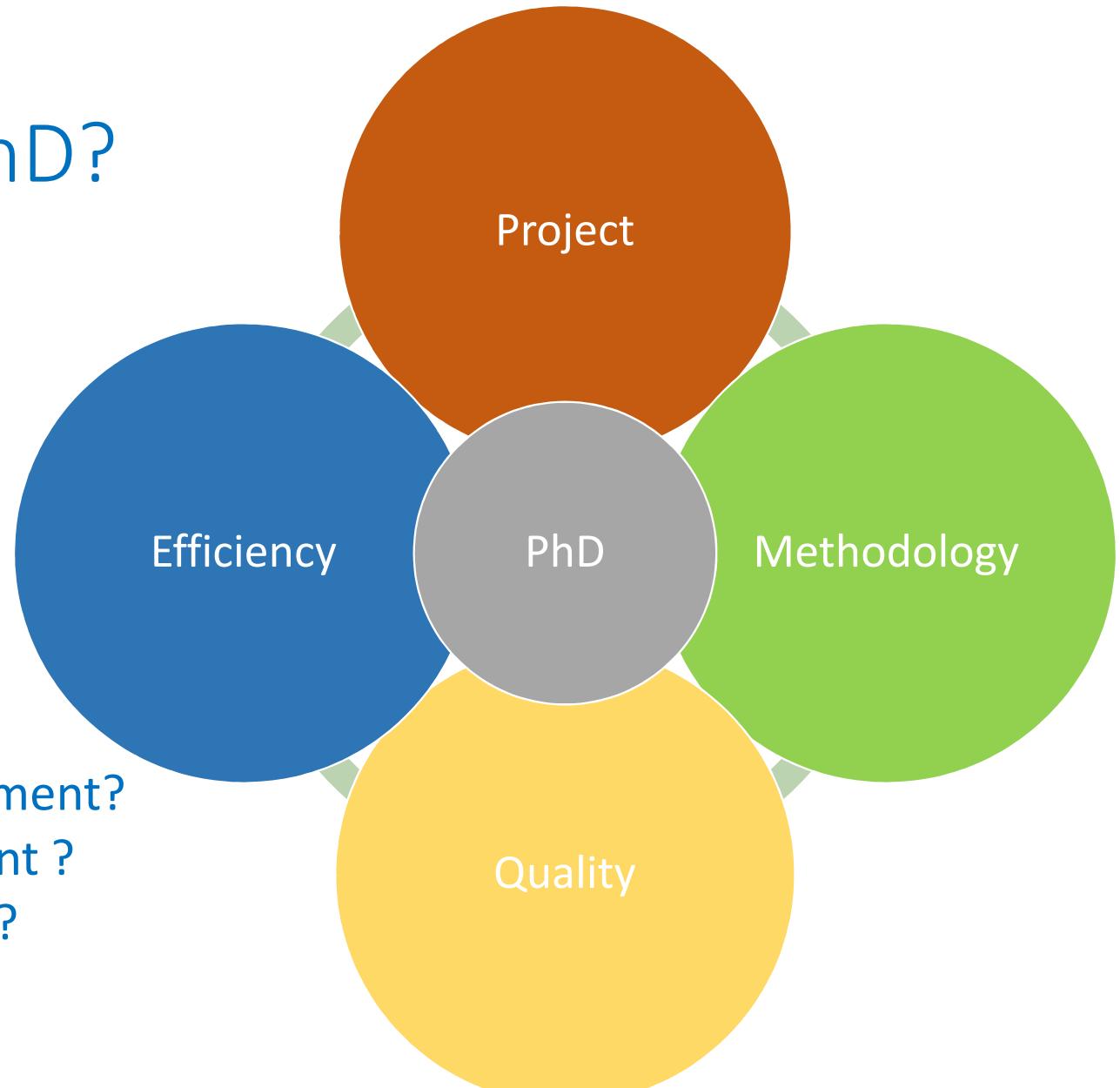
« The » method ?
« A » method ?

Essentials :

- Data collection, measurements
- Analysis
- Presentation
- Interpretation
- Comparison to hypothesis
- Work ith others
- Supervisor



What about my PhD?



- Is it managed as a project?
- What about quality management?
- How could it be more efficient ?
- On what should I focalise on?



Ethics

A professional is able to ...

- Apply **rules** and **regulation**
- Think and act **appropriately** in his context and work environment
- **Respond** for his actions

Which rules and regulations ?

- Given by law at the national or international level
- Used in your discipline
- Given by your institution

EU Check list

Informed Consent

• Does the proposal involve children?	select
• Does the proposal involve patients or persons not able to give consent?	select
• Does the proposal involve adult healthy volunteers?	select
• Does the proposal involve Human Genetic Material?	select
• Does the proposal involve Human biological samples?	select
• Does the proposal involve Human data collection?	select

Research on Human embryo/foetus

• Does the proposal involve Human Embryos?	select
• Does the proposal involve Human Foetal Tissue / Cells?	select
• Does the proposal involve Human Embryonic Stem Cells?	select

Privacy

• Does the proposal involve processing of genetic information or personal data (e.g. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)	select
• Does the proposal involve tracking the location or observation of people?	select

Research on Animals

• Does the proposal involve research on animals?	select
• Are those animals transgenic small laboratory animals?	select
• Are those animals transgenic farm animals?	select
• Are those animals cloned farm animals?	select
• Are those animals non-human primates?	select

Research Involving Developing Countries

• Use of local resources (genetic, animal, plant etc)	select
• Benefit to local community (capacity building i.e. access to healthcare, education etc)	select

Dual Use

• Research having direct military application	select
• Research having the potential for terrorist abuse	select

ICT Implants

• Does the proposal involve clinical trials of ICT implants?	select
--	--------

A) I confirm that none of the above issues apply to my proposal yes no

B) Whenever your research project raises ethical issues, how do you intend to address these issues?

Please describe the way the issues are handled:



SUSTAINABLE DEVELOPMENT GOALS





Suggestion :

Discuss on the ethical issues of your PhD project
with your supervisor

(...)

Ethical dilemma

- What's the problem?
- Who is affected by the situation (persons, institutions, society, ...)
- What are the interests ? Conflicts of interests ?
- What is acceptable (ethically, morally, logically) ? If not, what can be done for making it acceptable? Who will decide of sanctions?
- What else can be done?
- For each of the parties, what do you suggest?
- What can be done for avoiding conflicts? How can we find a consensus?

Ethical decision making

- What is the problem/issue/dilemma to be solved?
- Who are the affected parties in this situation (individuals, institutions, a field, society)?
- What interest does each party have in the situation? Which interest are in conflict?
- Where the actions taken by each of the affected parties acceptable (ethical, moral, common sense)? If not, are there circumstances under those actions would have been acceptable? Who should impose sanction(s)?
- What other courses of action/options are open to each of the affected parties? How do ethical codes or policies as well as legal rules apply to these different options? What is the likely outcome of each course of action?
- For each party involved, what course of action would you take, and why?
- What actions could have been taken to avoid conflict? How can we find consensus for action ?

Case study

(from David B. Resnik, 12/2015, <http://www.niehs.nih.gov/research/resources/bioethics/whatis/>)



- The research protocol for a study of a drug on hypertension requires the administration of the drug at different doses to 50 laboratory mice, with chemical and behavioral tests to determine toxic effects. Tom has almost finished the experiment for Dr. Q. He has only 5 mice left to test. However, he really wants to finish his work in time to go to Florida on spring break with his friends, who are leaving tonight. He has injected the drug in all 50 mice but has not completed all of the tests. He therefore decides to extrapolate from the 45 completed results to produce the 5 additional results.

- What do you think about that ?
- What should he do?

Case study

(from David B. Resnik, 12/2015, <http://www.niehs.nih.gov/research/resources/bioethics/whatis/>)



- Dr. T has just discovered a mathematical error in his paper that has been accepted for publication in a journal. The error does not affect the overall results of his research, but it is potentially misleading. The journal has just gone to press, so it is too late to catch the error before it appears in print. In order to avoid embarrassment, Dr. T decides to ignore the error.
 - What do you think about that? Is it really a misconduct?
 - What should he do?
 - Do you know about other deviations in publishing?

- Do you have any case study you would like to share or to discuss with the others ?

Who can help you on ethical issues ?

- Yourself
- Your supervisor
- Your colleagues
- Your thesis committee
- Confidence persons/ombudsman of the university
- University's Ethics committee

List of violations

4 « chapters »

- in obtaining scientific knowledge
- in collaboration and publication
- in obtaining research funding
- in scientific expertise for a third party
- (...) non exhaustive

Source : https://www.recherche.uliege.be/cms/c_9022717/fr/ethique-et-integrite-scientifique

List of violations

- **In terms of obtaining scientific knowledge:**
 - The fabrication of research results.
 - The intentional falsification, presentation and misleading treatment of source data or research results, the exclusion of data without indication or without due reason.
 - Pressure placed on a researcher by a manager to modify source data or research results.
 - The deletion of data which has been recorded, before expiration of the recommended retention period or after having been notified of a third party wishing to consult them.
 - Concealing data.
 - Refusal to grant duly authorized third parties the right to consult source data.

Source : https://www.recherche.uliege.be/cms/c_9022717/fr/ethique-et-integrite-scientifique

List of violations

- **In terms of collaboration and publication:**

- Copying basic data and other data without the agreement of the head of the relevant project (pirating data).
- Sabotaging the work of other researchers, whether in the same research group or not, particularly by concealing and making unusable, in a targeted way, research material, equipment, source data and other recorded work.
- The publication, under one's own name, of written work, research results and discoveries of a third party (University researchers or researchers from outside the University).
- Fraudulently obtaining the status of co-author of a publication without having contributed to it.
- Fraudulently obtaining the title of inventor of an invention without having made an inventive contribution to it.

Source : https://www.recherche.uliege.be/cms/c_9022717/fr/ethique-et-integrite-scientifique

List of violations

- **In terms of collaboration and publication (cont'd):**
 - The deliberate omission of project collaborators who made essential contributions to a project; the mention, without their agreement, of an individual as a co-author, regardless of their contribution to the project.
 - The deliberate omission of essential contributions or citations of other authors on the same subject.
 - Intentionally false citations drawn from existing or supposed work from third parties.
 - Incorrect indications on progress of the publication of one's own work (for example, 'manuscript submitted' when the manuscript has not yet been sent, 'publication in press' when the paper has not yet been accepted).

Source : https://www.recherche.uliege.be/cms/c_9022717/fr/ethique-et-integrite-scientifique

List of violations

- **In terms of obtaining research funding:**
 - Concealing conflicts of interest, financial arrangements or collaboration procedures which could, if they were known, influence the reading of scientific results.
 - Acceptance of collaboration agreements which do not preserve the researcher's independent judgement, restricting his or her freedom to publish (in particular negative results), or impose upon him or her a right to examine publications beyond what is reasonably useful to preserve any rights to intellectual property.
 - Acceptance of funding sources or mandates which the University has previously stated as being ethically incompatible with the role of a researcher within the University.
 - Acceptance of funding sources or mandates when the researcher knows that these will limit their independence in relation to their work or presentation of their results.

Source : https://www.recherche.uliege.be/cms/c_9022717/fr/ethique-et-integrite-scientifique

List of violations

- **In terms of scientific expertise for a third party (for example, reviewing articles submitted for publication):**
 - Deliberately not mentioning conflicts of interest.
 - Violating the obligation of secrecy (obligation of confidentiality).
 - The erroneous criticism, either deliberately or through negligence, of projects, programmes and manuscripts.
 - Unfounded opinions with a view to procuring benefits, either personally or for third parties.
 - The unfounded blocking of a publication which is at the revision stage.

Source : https://www.recherche.uliege.be/cms/c_9022717/fr/ethique-et-integrite-scientifique

About confidents

- To whom complain?
- Training of confidents
 - How to listen, give feedback, balance confidentiality/alarm
 - How to distinguish between problems
 - Harassment
 - Ethics
 - Others
 - Professionals (psychologists) or persons experienced in research? How to be synchronized ? How to grow in experience ?
 - What about independance? Links to the board, the CEIS?

Source : https://www.recherche.uliege.be/cms/c_9022717/fr/ethique-et-integrite-scientifique



Open Science

The future
of science
is open

Open
Science



OS : an ethical question?

- Research is supported by public funds
- Researchers are doing research and produce results
- Knowledge is to be disseminated to the society
- Publishers make money on results and publication
- They request for assigning copyright
- Researchers and the society pay for knowing about knowledge development

How to describe Open Science?

There are many definitions but
maybe Open Science is:

- A system of practices that moves towards a more open, collaborative, data-intensive and networked way of doing research and sharing research results, enabled by developments in ICT and related infrastructures and the increasing proliferation of data.

Or Open Science is:

- ***Just science done right!***
- ***Excellent science!***



Stickers: Melanie Imming, ImmingImpact

Why is Open Science so important?

It's good for science: efficiency, verifiability, transparency, inter-disciplinarity

It's good for the economy: access to and re-use of scientific information by industry, innovation

It's good for society: broader, faster, transparent & equal access for citizens, increased societal impact of science and research

**Open Science is irreversible and
is not happening in isolation**

Open Science

The future
of science
is open

*“When all researchers are aware of Open Science, and are trained, supported and guided at all career stages to practice Open Science, the potential is there to **fundamentally change the way research is performed and disseminated**, fostering a scientific ecosystem in which research **gains increased visibility**, is **shared more efficiently**, and is performed with **enhanced research integrity**. It can create unprecedented connections between researchers and the general public, allowing for a vibrant **citizen science** movement, poised to have transformative effects on how research is executed.”*

“The HRS4R should integrate Open Science skills as part of researcher career development.”

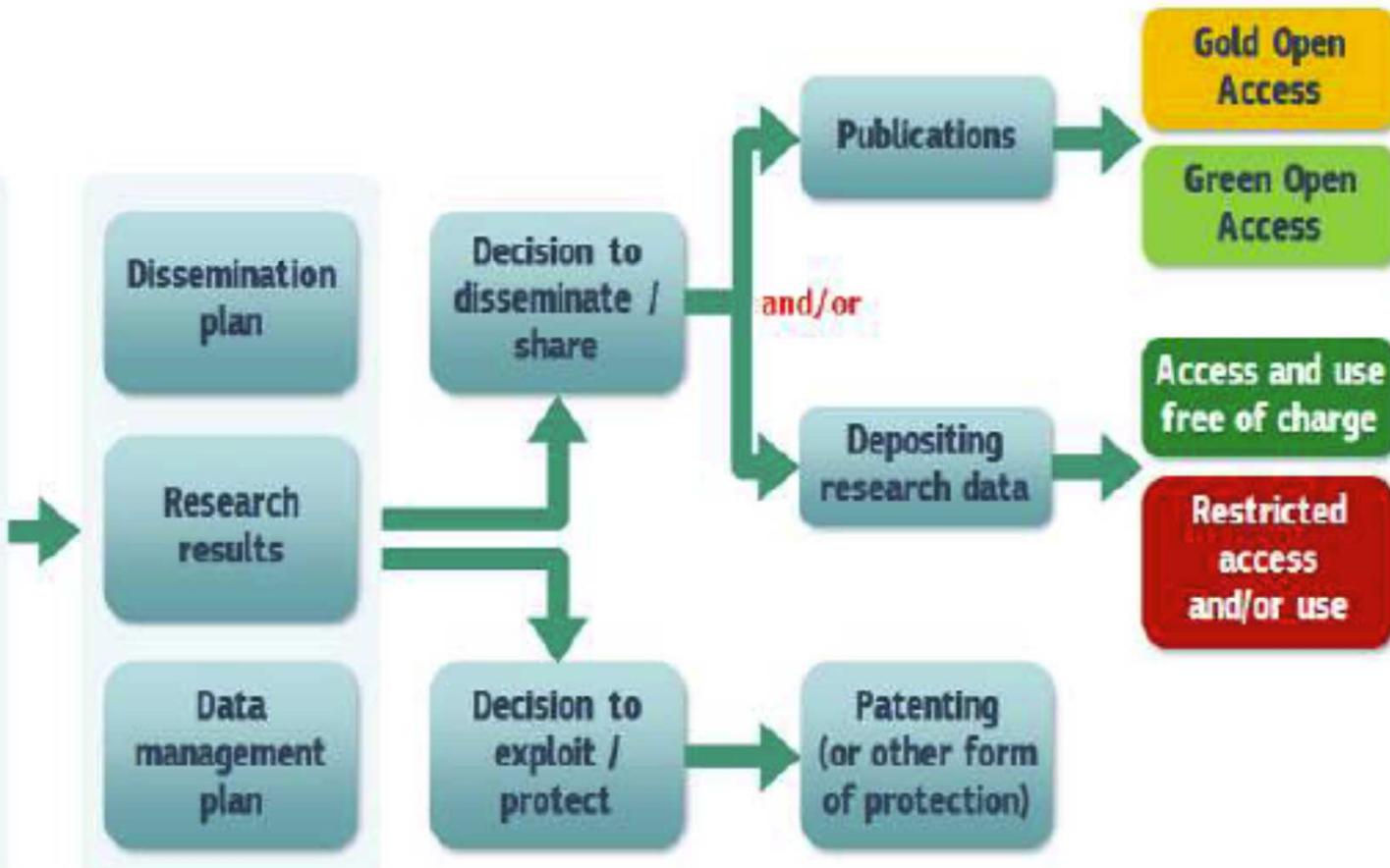
(Skills Report, 2017)



Open Science

The future
of science
is open

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Career and Open Access?

- OA journals are peer reviewed
- There are lists of excellent OA journals
- Open Access and Open Repository (incl. citations)
- Open data



OS Skills development

is an integral part of researchers' career development

- Library and research information (library support)
- Open publication literacy
- Open Access publishing
- Data management and Open data
- IP, copyright, Fair data
- Research Integrity and ethics
- « Citizen science » skills
- Outreach of research



« *Pars-en-thèse* »
« *CUPPD* »
« *Seminar and Training* »
« *PSRL* »

Open Research Data pilot

What to do?

Data Management Plan

+

deposit in a research data repository

+

take measures to make it possible for third parties to
access, mine, exploit, reproduce and disseminate free of
charge

+

provide information via the repository to validate results



But not all data can be open

“as open as possible, as closed as necessary!”

Projects can therefore partially or totally opt out at any stage (either before or after signing the grant) or stay in and have their data closed (and “just” have a DMP) if they explain that:

- participation is incompatible with the obligation to protect results that can reasonably be expected to be **commercially or industrially exploited**
- participation is incompatible with the need for **confidentiality** in connection with security issues
- participation is incompatible with rules on protecting **personal data**



Efficient collaboration

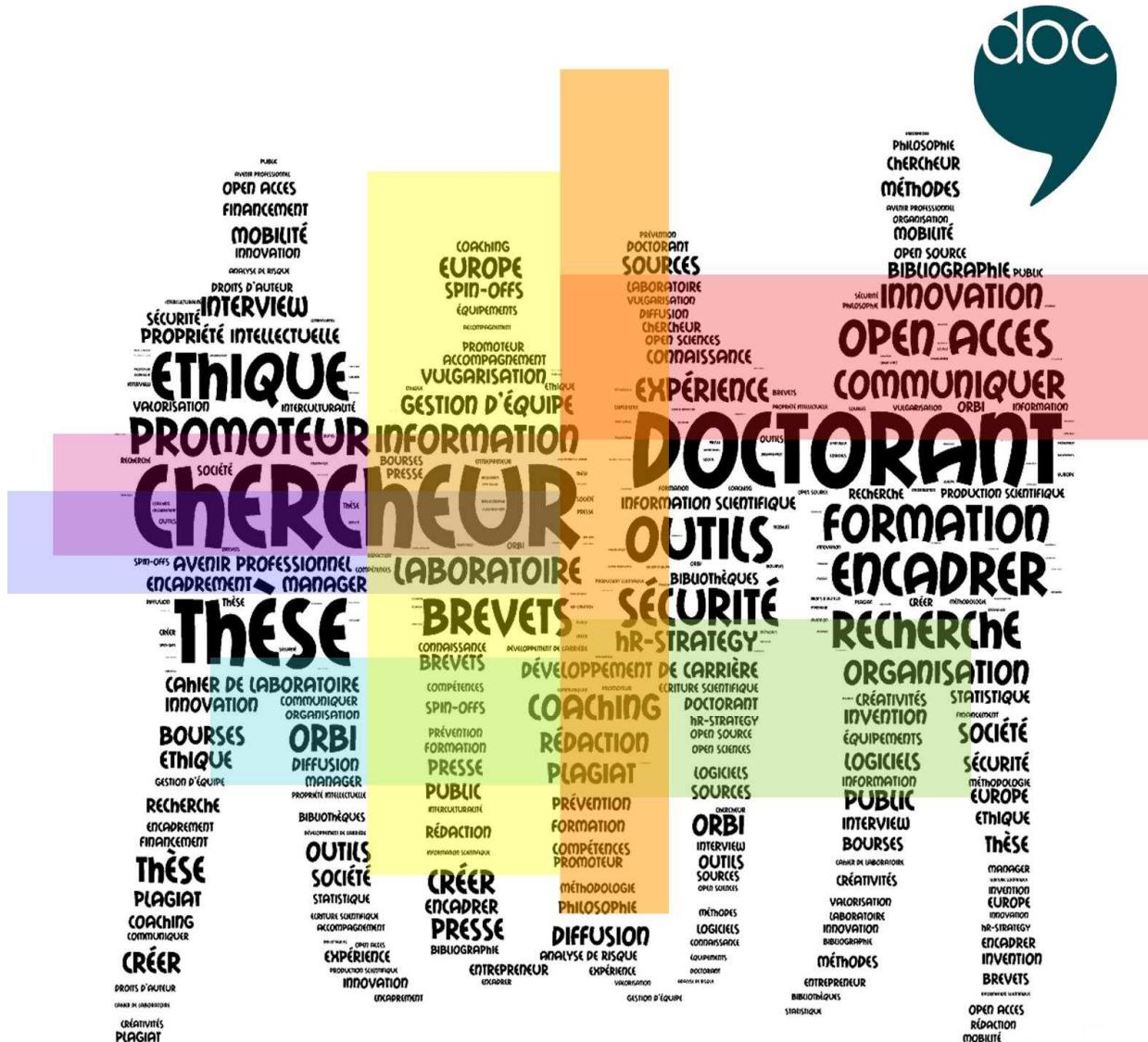
Your work environment

Is not limited to the lab
Nor to the computer or the library
Not only research is of concern



Stakeholders ...

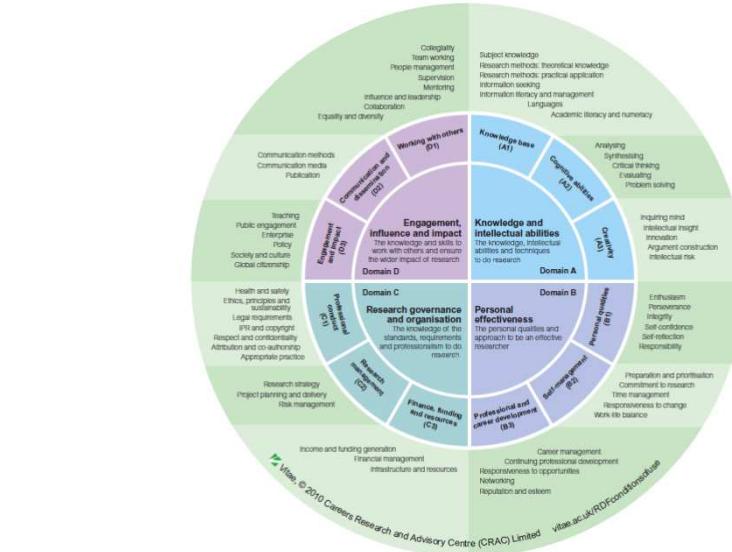
- PhDs
- Supervisors
- Colleagues
- University



A good supervisor is ...

(Said by the participants):

- Has the knowledge and can share it
- Is aware of the work done
- Gives constructive feedback
- Pass a clear message
- Is able to assess progress
- Has a realistic analysis of what has to be done
- Explain new directions
- Gives freedom in methodology
- Is present
- Helps to construct the network

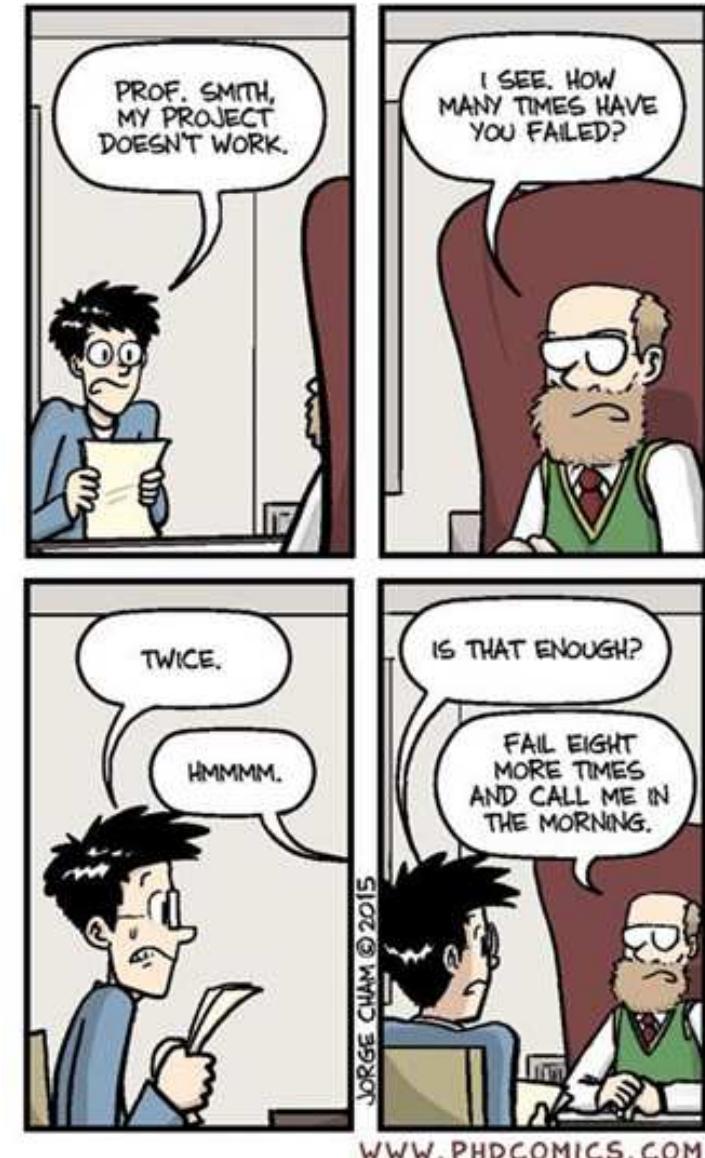


The RDF's competences
are also for
experienced researchers!

Supervisor ...

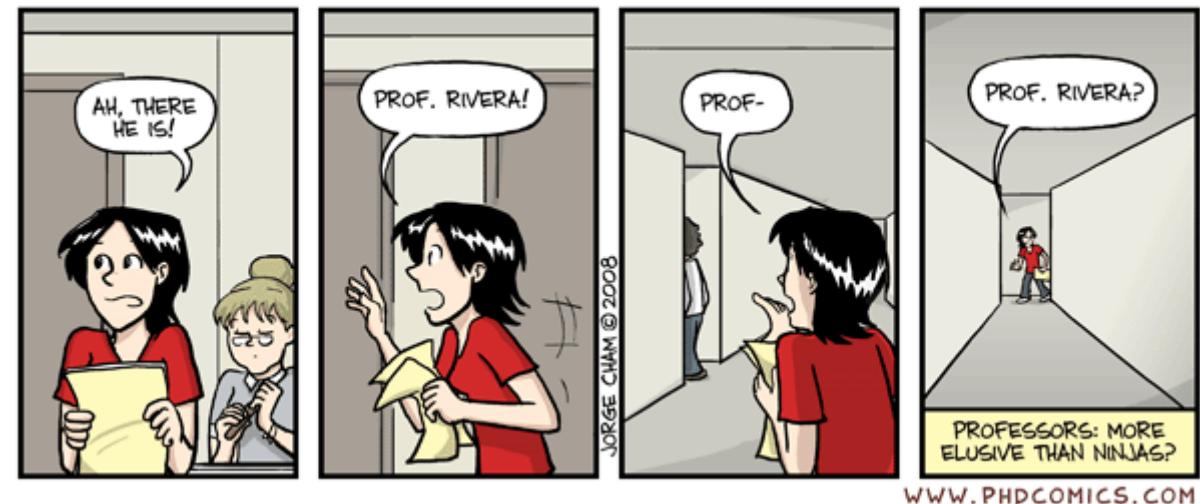
- Supports for developing a research of quality
 - Definition and management of the projects
 - Regular meetings :
 - Evaluation of progress
 - Discussion on scientific questions
 - Directions for training
 - Advices for publishing
- Supports for integrating and developing network
- Supports you in developing your career

TRUST, CONFIDENCE



Role of experienced researchers

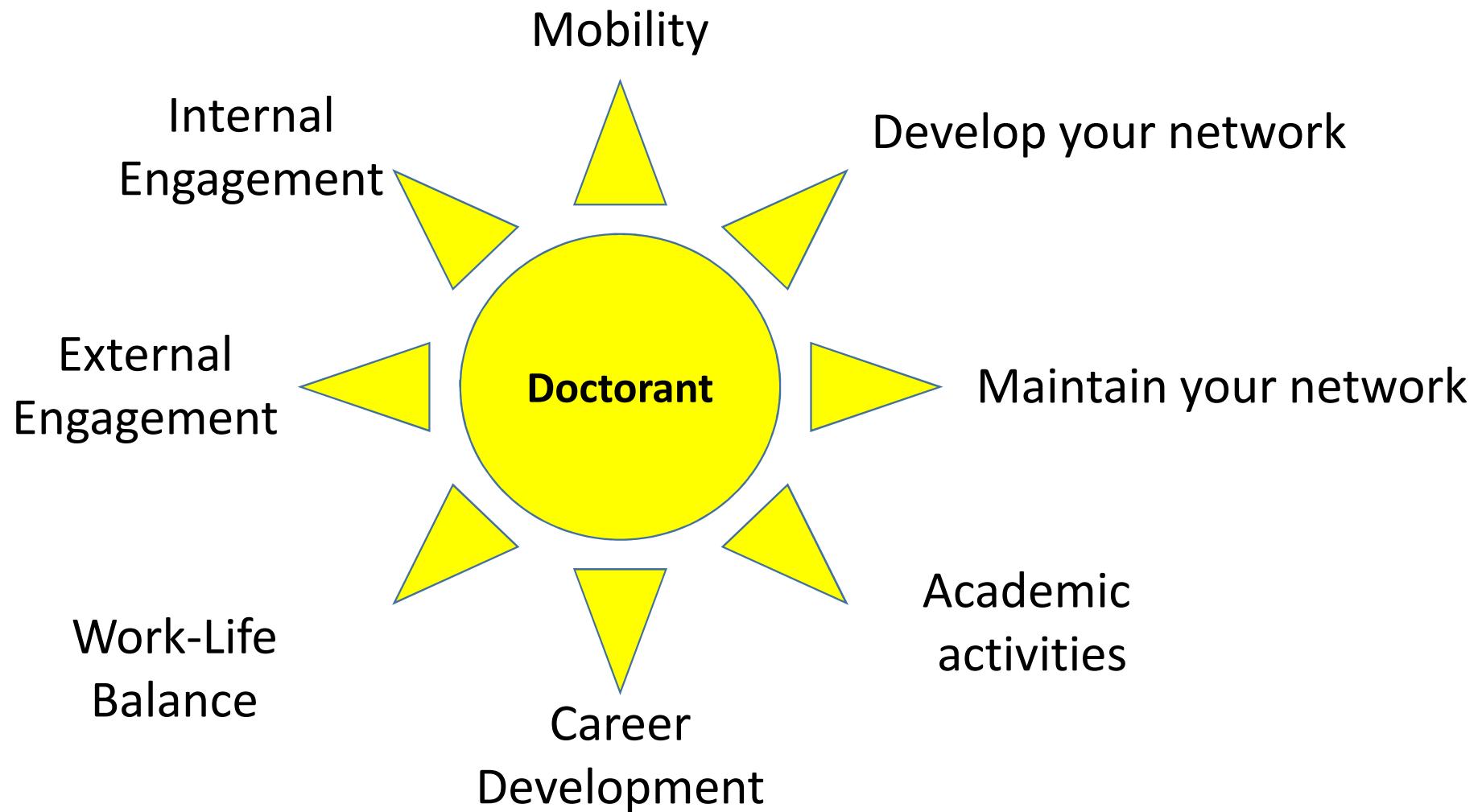
- Be an example for the job
- Assistance on research, ethics, deontology
- Proximity support
- Communication and dissemination





Last but not least

Besides the research work ...



Contact



Administration de la recherche

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Useful links

- **Competences:**

- European Charter and Code for researchers: <https://euraxess.ec.europa.eu/jobs/charter>
- Vitae Researcher Development Framework (RDF): <https://www.vitae.ac.uk/vitae-publications/rdf-related>
- Research Careers: <https://euraxess.ec.europa.eu/useful-information/policy-library#document-collapsible-research-careers-strengthened-hrs4r-process>

- **Ethics:**

- Ethics review – H2020 Online Manual – EU:
http://ec.europa.eu/research/participants/docs/h2020-funding-guide/grants/from-evaluation-to-grant-signature/grant-preparation/ethics_review_en.htm
- European Group on ethics in Science and New technologies (EGE):
https://ec.europa.eu/info/research-and-innovation/strategy/support-policy-making/scientific-support-eu-policies/european-group-ethics-science-and-new-technologies-ege_en
- GDPR: <https://eugdpr.org/>
- Ethics @Uliège: https://www.recherche.uliege.be/cms/c_9022717/en/ethics-and-scientific-integrity

Useful links

- **Open Science:**

- Providing researchers with the skills and competencies they need to practice Open Science (“Skills Report”): https://cdn1.euraxess.org/sites/default/files/policy_library/ec-rtd_os_skills_report_final_complete_2207_1.pdf
- Evaluation of Research Careers fully acknowledging Open Science Practices (“Rewards Report”): https://cdn1.euraxess.org/sites/default/files/policy_library/os-rewards-wgreport-final_integrated_0.pdf
- Open Repository & Bibliography @ULiege : <http://orbi.uliege.be>
- Open Science @ULiege: https://www.recherche.uliege.be/cms/c_9022722/en/open-science
- Bernard Rentier's Blog: <https://bernardrentier.wordpress.com/>

- **Supervision:**

- EUA-CDE reports and publication: <https://eua-cde.org/reports-publications.html>
- Supervising PhD students: 'the 10+ commandments': <https://www.rug.nl/research/behavioural-cognitive-neurosciences/education/phd/supervising-phd-students-the-10-commandments>
- Ten types of PhD supervisor relationships – which is yours? <https://theconversation.com/ten-types-of-phd-supervisor-relationships-which-is-yours-52967>
- What to Expect from your PhD Supervisor: <https://www.findaphd.com/advice/doing/phd-supervisor-expectations.aspx>