# Open Science education at doctoral level

## Slovak Open Science Forum

28 Nov 2023, Bratislava

**Eva Hnatkova, PhD** - Open Science Coordinator

eva.hnatkova@techlib.cz

# About me

UNIVERSITY OF
CHEMISTRY AND TECHNOLOGY
PRAGUE

NTK
50°6'14.083"N, 14°23'26.365"E
Národní technická knihovna
National Library of Technology

**Eva Hnátková**

- Open Science coordinator at
  - National Library of Technology
  - UCT Prague
- Former Eurodoc president
- National Contact for Scientific Information

European Commission

**CoNOSC**
Council of National Open Science Coordination
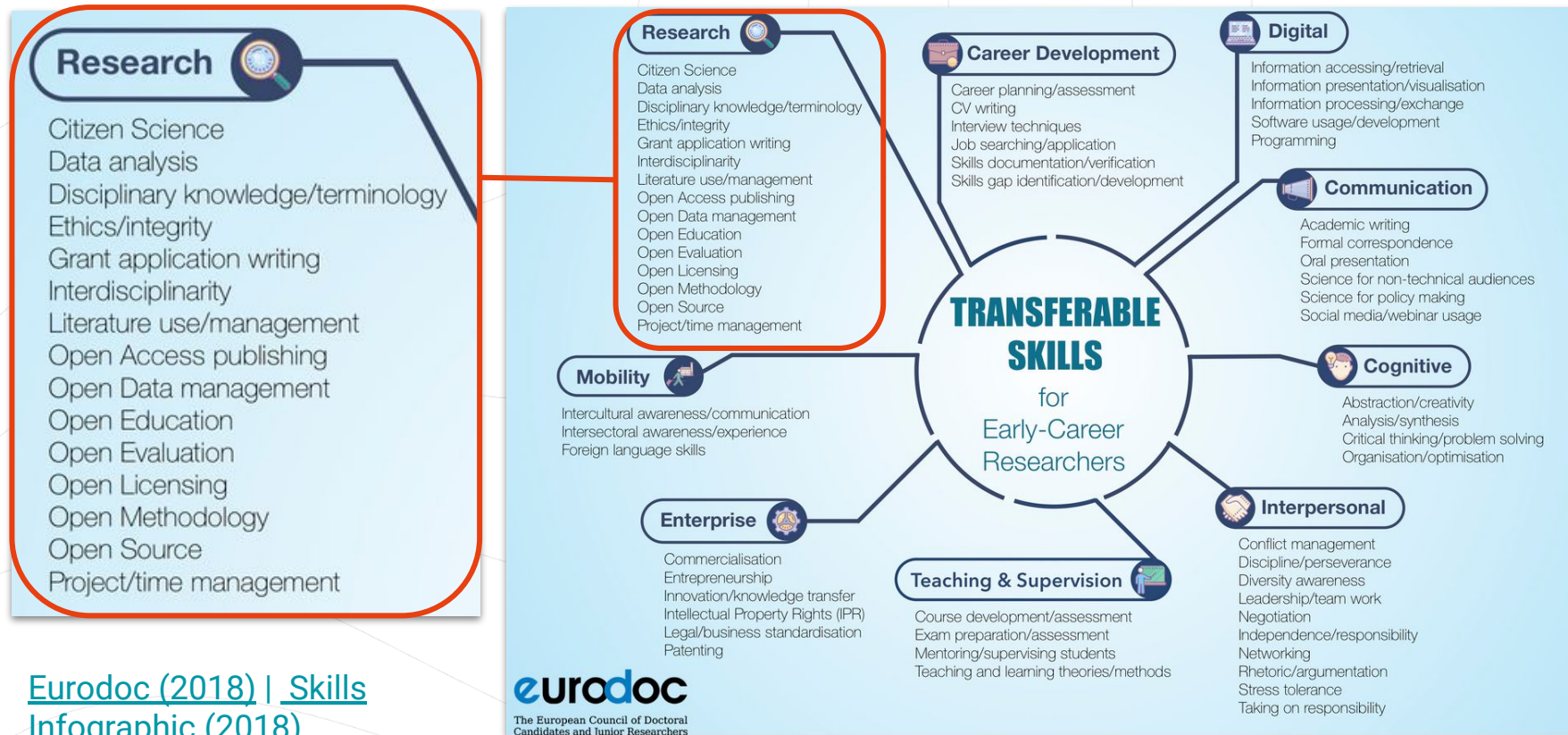
**eosc**

**CoARA**

# This talk

- **Data Stewardship course** designed primary for PhD candidates

- The course was developed by the EU project DocEnhance and training resources are **freely available to all**

- **Training resources** (courses, guidelines) **can be** easily **adapted** to local needs and **integrated into existing PhD programmes**

# What are challenges for ECRs?

- Researchers are **unaware** to what Open Science is and how to do it
- Lack of **training courses** on Open Science, Research Data Management or Data Management Plans (DMP)
- Lack of **support** at institutions (no guidelines, no specialists)
- Lack of a clear **Open Science policy** at institutions
- Lack of **strategic plans** to implement Open Science at national level

O'Neill G., Hnatkova E. (2018) Open science for early-career researchers, Science Impact

# Transferable skills for ECRs

**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

**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

**Cognitive**
- Abstraction/creativity
- Analysis/synthesis
- Critical thinking/problem solving
- Organisation/optimisation

**Mobility**
- Intercultural awareness/communication
- Intersectoral awareness/experience
- Foreign language skills

**TRANSFERABLE SKILLS**
for
Early-Career
Researchers

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

**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

**eurodoc**
The European Council of Doctoral
Candidates and Junior Researchers

Eurodoc (2018) | Skills
Infographic (2018)

# The European Competence Framework for researchers

**ResearchComp**

Mobilise resources
Manage projects
Negotiate
Evaluate research
Promote open access publications

Manage research data
Promote citizen science
Manage intellectual property rights
Operate open source software

Have disciplinary expertise
Perform scientific research
Conduct interdisciplinary research
Write research documents
Apply research ethics and integrity principles

Participate in publication process
Disseminate results to the research community
Teach in academic or vocational contexts
Communicate to the broad public
Increase impact of science on policy & society
Promote open innovation
Promote the transfer of knowledge

**Managing research**

**Managing research tools**

**Doing research**

**Research Comp**

**Making an impact**

**Cognitive abilities**

**Self-management**

**Working with others**

Abstract thinking
Critical thinking
Analytical thinking
Strategic thinking
Systemic thinking
Problem solving
Creativity

Interact professionally
Develop networks
Work in teams
Ensure wellbeing at work
Build mentor-mentee relationships
Promote inclusion & diversity

Important to keep in mind that:

- All competences are equally important & interrelated

- Each stakeholder can use the Framework as a starting point to address its own needs

- Researchers need to develop competences in all 7 areas, but should <u>not</u> acquire the same or the highest level of proficiency for all competences

- Manage personal professional development
- Show entrepreneurial spirit
- Plan self-organisation
- Cope with pressure

European Commission

Source: KRECon 2022 presentation "Towards a European framework for research careers" (CC BY-NC-ND) European Commission
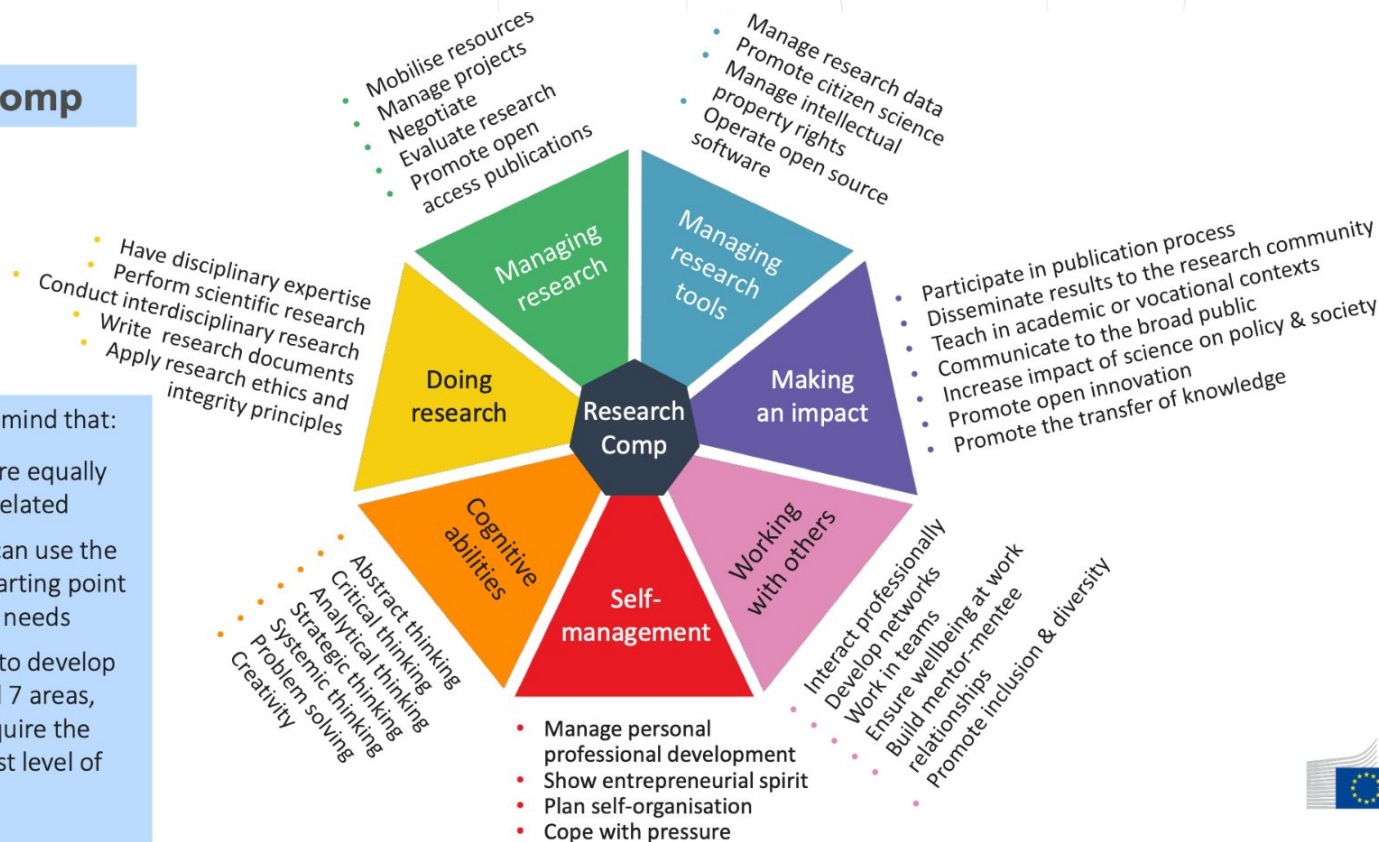
# RearchComp - Open Science skills

- Manage **research data**
- Promote **Citizen Science**
- Manage **intellectual property rights**
- Operate **Open Source Software**
- Promote **Open Access publications**
- Participate in the **publication process**
- **Disseminate results** to research community/general public
- Apply **research** ethics and **integrity** principles

Source: [The European Competence framework for researchers (2023)](#)

# Transition towards Open Science

- **Open scholarly communication**
- **FAIR Data** and **other outputs**
- **Societal engagement**



Picture from UNESCO Recommendations on Open Science (2021) under CC BY-SA
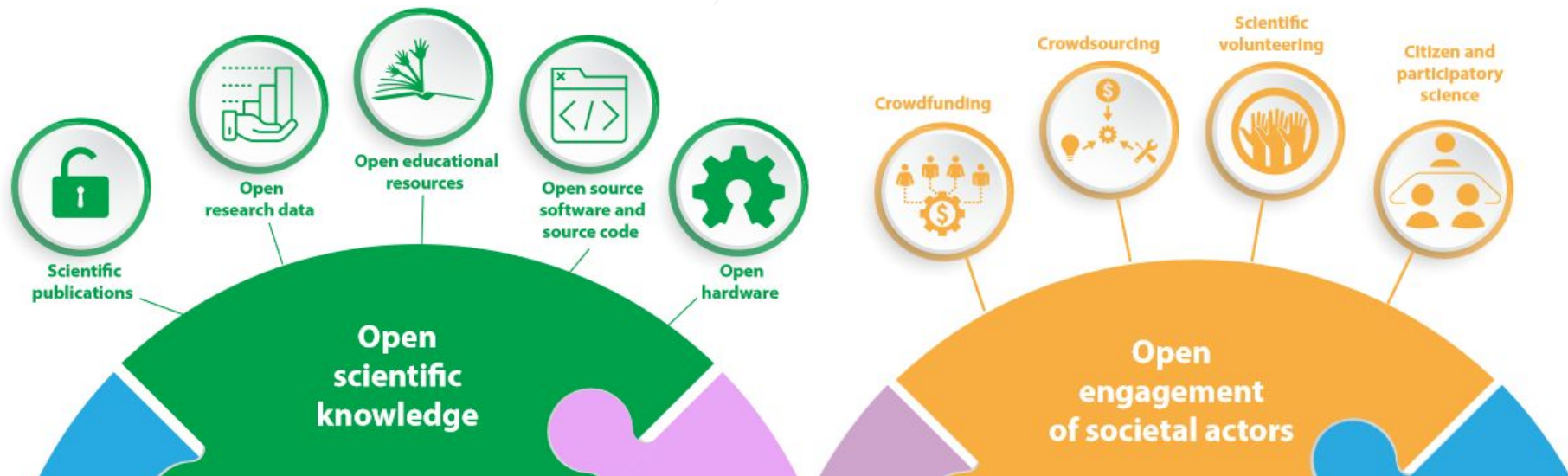
# OS adoption approach for RPOs

- Policies and guidelines
- **Awareness and education → DE**
- Infrastructure and tools
- Support for researchers
- Collaboration encouragement
- Community building
- Incentives and recognition
- Monitoring and evaluation

Source: EOSC-A TF REA - Model for adoption

Partners of DocEnhance project during the kick-off meeting in Tromsø

# DocEnhance

- EU project 2020 - 2022
- 19 partners


UiT The Arctic University of Norway

# DocEnhance aims

- Collect **evidence on PhDs' employment** and **skills** usage

- Develop and integrate **transferable skills training** into **existing PhD programmes**

- Increase **interaction with non-academic sector**

**Broadening PhD expertise**
through transferable skills

28/11/2023

# Why DocEnhance?

- PhD holders more likely to follow a **career outside the university** as numbers of PhDs on the rise (OECD, Education at a Glance, 2019; Kehm, 2007)

- Reported mismatches between employers' needs and skills developed in doctoral programmes (DeGrande et al, 2014; Bebiroglu et al, 2022)

- *"Offering training in transferable skills … is central, and should be a priority for doctoral schools and programmes"* (Salzbourg II recommendations, EUA, 2010)

- *"Identifying missing elements of skills training remains an important task…"* (Survey "Doctoral Education in Europe today", EUA-CDE, 2022)

# Design of 3 pilot courses

## on transferable skills for doctoral candidates/supervisors

**Freely available and designed to be easily adapted and integrated at HEIs**



- Data Stewardship

- Career management & entrepreneurship

- Supervision

All modules include exam tests and certification

28/11/2023

DocEnhance

# A Novel Course Concept
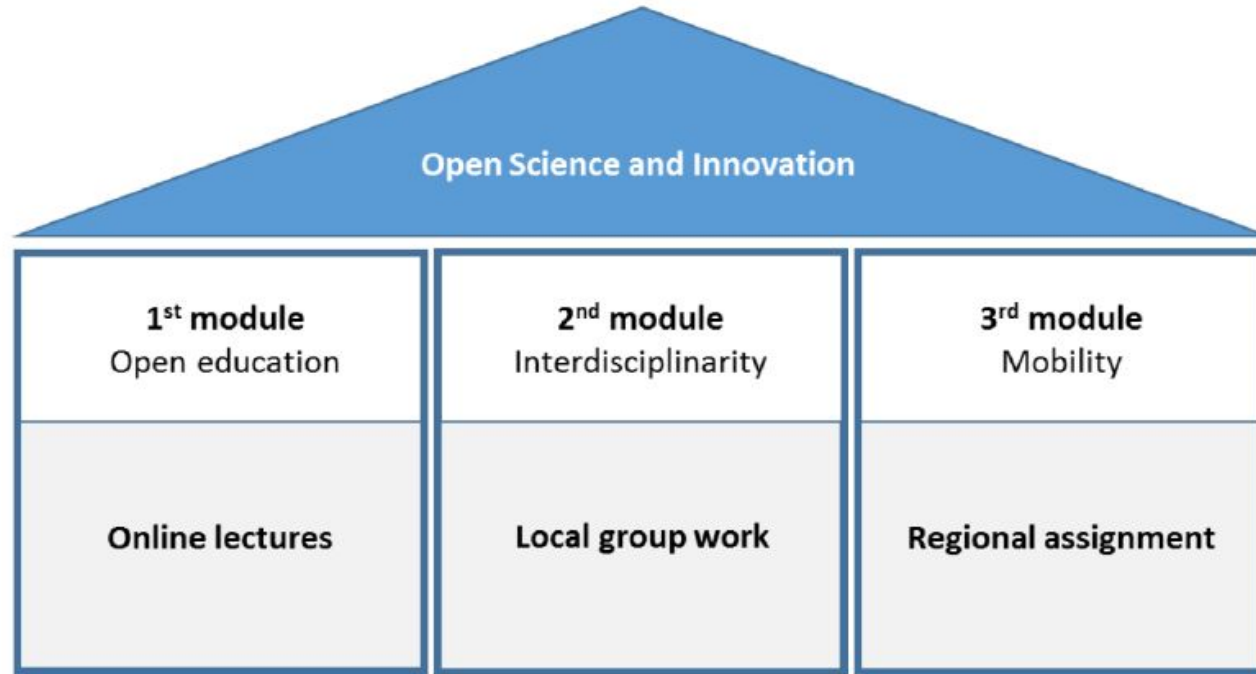


Open Science and Innovation

| 1st module | 2nd module | 3rd module |
|---|---|---|
| Open education | Interdisciplinarity | Mobility |
| Online lectures | Local group work | Regional assignment |

28/11/2023

# Concept and methodology

Co-creation approach ➡ Skills intelligence ➡ Skills integration
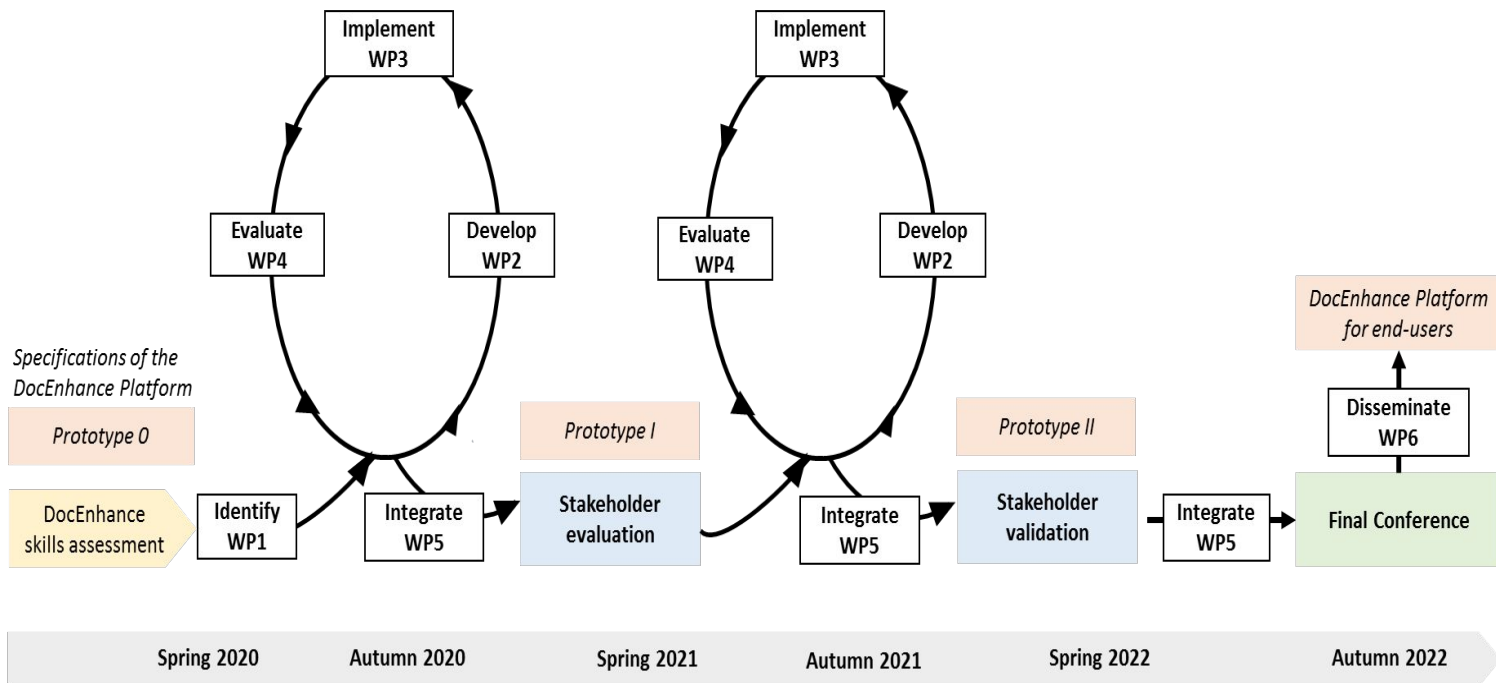
28/11/2023

# Data stewardship

**Aims of this course**: to introduce PhD candidates the complexity of research data management from finding relevant data to publishing an own dataset

## PhD candidates, learn:

- How to develop and use a Data Management Plan

- How to store and archive data

- How to use licenses, repositories, database platforms, data search engines, apps...

...and much more!

# Data stewardship

This course was developed in 2020/2021 by a group of RDM specialists at UiT, involved in RDM teaching at the institution

**UiT** The Arctic University of Norway

Three-person working group in charge of it all

- [Helene N. Andreassen](#)
- [Henning Hansen](#)
- [Leif Longva](#)

DocEnhance

# Data stewardship

## 1st Piloting course (2021)

- **University of Chemistry and Technology in Prague, Czechia**

~ 25 PhD candidates

~ 8 teachers

**Pilot** - financial remuneration for active participation and subsequent feedback

- **Karlstad University, Sweden**

~ 14 PhD candidates

28/11/2023

# Data stewardship

| MODULE 1 | MODULE 2 | MODULE 3 |
|---|---|---|
| online lectures | workshops & tasks in local working teams | workshops & regional assignments with employers |
| • general introduction<br>• basics of how to handle research data in a PhD thesis<br><br>**Each participant goes through M1 individually** | • learning by doing<br>• practical assignments<br>• working in small groups<br>• discussions<br>• local resources (e.g. DMP)<br>• meet local demands<br><br>**#Interdisciplinarity**<br>**#Teamworking** | • practical tasks in cooperation with business / public service entity<br>• help to prepare PhD candidates for a career outside academia<br>• putting into practice the theory & practical skills<br><br>**#Inter-sectoral mobility** |

28/11/2023

# Data stewardship – Module 1

## 10 thematic issues

**Focus on motivation, theory and concepts** (~ 16 hours)

1. Introduction
2. About research data
3. How to search & cite research data
4. How to structure & document research data
5. How to store research data
6. Data cleaning, analyzation & visualisation
7. How to archive research data
8. Rights & licenses for research data
9. How to write a research DMP
10. Summary and exam quiz

**Video**, suggested **readings**

Interaction via **quizzes** and open « **food for thought** »

DocEnhance

# Data stewardship – Module 1

## Moodle

### DocEnhance Data Stewardship course: Module 1

**E-learning VŠCHT**

- 🎓 DocEnhance Data Stewardship course: Module 1
- 👥 Participants
- 🛡 Badges
- ☑ Competencies
- ▦ Grades
- 🏠 Home
- 🧭 Dashboard

#### 5.3 The Readme-file

What is meant by documenting a dataset? And why is documenting a dataset important? In this video you will learn why good documentation of a dataset is crucial in order to avoid misinterpretation of the dataset.

**How to write a Readme-file**
What should be included?

✓ - Contact information to the dataset author
   - Include also author's ORCID
✓ - What the data set is about
   - Write a short description
   - Include information on project relations
✓ - File structure and naming syntax
✓ - Where to find which data => overview of the files
✓ - Information on updates to your data set

Transcript of video "How to structure …: Documenting your data - The Readme-file"

**Lessons learned:**

- To document a dataset is to give a human readable introduction and explanation of what information the dataset holds.
- You document your dataset by creating a separate file usually called a Readme file.
- The information in the Readme file should make sure anyone are able to understand and interpret your dataset correctly, both now and also many years from now.
- You should start entering information into your Readme file early, and update the file as new information is obtained.
- The Readme file should supplement the information found in the dataset's metadata.
- The Readme file should be in plain a preferred format, either plain text with UTF8, or PDF/A.

**Food for thought**
Think through your own PhD project and the data you have collected, or plan to collect. What do you see as essential to include and explain in a Readme file, to make sure your dataset is understood correctly by outsiders?

28/11/2023

# Data stewardship – Module 1

## Exam quiz & certification

**Final exam quiz**

If you get 80% or 24 correct answers

⬇

**Certification M1**

generated by the Moodle

Prerequisite for M2



UNIVERSITY OF CHEMISTRY AND TECHNOLOGY PRAGUE

29/04/21

This certification is awarded to

**Anna Chmelová**

in recognition of the successful completion of the

**DocEnhance Data Stewardship course Module 1**

DocEnhance has received funding from the European Union's Horizon 2020 Science with and for Society programme under grant agreement no. 872483

28/11/2023

# Data stewardship – Module 2

## Workshops & assignments

- Organised by university with trainers
- Materials for trainers on the Moodle
- The local trainers decide which content and activities to use
- 6 workshops (3 hours)
- Participants worked in small groups



Introduction (for trainers)
#1: The importance of RDM & open archiving
#2: Data Management Plan
#3: Structuring & documenting research data

#4: Data storage, file formats & FAIR principles
#5: Archiving research data
#6: Searching, citing and licensing research data
Exam assignment

28/11/2023

# Data stewardship – Module 3

## Organized in cooperation with non-academic sector

- Focus on application of knowledge from M1 & M2

- Support material on the Moodle

- Contains advice on how to involve the non-academic sector, possible assignments & an exam assignment



Trip to Orlen Petrol, Czechia

**The content of this module very much depends on the local stakeholders involved!!**

28/11/2023

# Why Data stewardship?

- Based on teamwork rather than individual study

- Opportunity for people to exchange experience

- Contact with private sector

- M3 can help with filling the gap between academia and private sector

**Positive feedback from participants at UCT Prague**

28/11/2023

DocEnhance

# Data stewardship

## Feedback from participants at UCT Prague

1. The course was evaluated highly positively. All agreed that the course will benefit them in the future.

2. All PhD candidates agreed that such a course should be offered to PhD candidates at the very beginning of their PhD journey.

3. The PhD candidates most appreciated the insight within the private sector, which most of them had not encountered before.

28/11/2023

# A short video from participants



https://youtu.be/dQmlq6ZXJhs?si=Tv9mQ733_OvXi0Pg

27

# Implementation of the course

**Data stewardship course**

- The local university decides whether PhD candidates receive credits for taking the course.
- All three modules come with an assignment that together may function as examination.

**Workload and ECTS credit points**

- ~ 80 hours (total course)
- 3 ECTS

More info at DocEnhance Data Stewardship Course: Executive summary and teacher guide

# DocEnhance platform

- A dynamic, adaptable & sustainable platform for **online collaboration**
- Integrated into the existing European **PhD Hub**
- There are **training resources freely available to all**

**The aim is supporting innovative career oriented PhD training**



https://courses.docenhance.eu/

29

# Module 1 on NTK website

- We currently have M1 open to everyone: https://moodle.techlib.cz/course/view.php?id=179
- If a users wants to take the test and get a certificate, they have to enroll in the course.
- Certificate is generated automatically for each user after passing the final test in M1.
- See How to enrol in a course in NTK Moodle.
- The course administrator can see records of enrolled participants (attendance, test grades, etc.).

# Module 1 available on NTK website

**NTK**
50°6'14.083"N, 14°23'26.365"E
Národní technická knihovna
National Library of Technology

---

NTK
50°6'14.083"N, 14°23'26.365"E
Národní technická knihovna
National Library of Technology

Home

🔍  🌐 English (en) ˅   You are currently using guest access   Log in

**✕**

˅ **0. Welcome**

  0.1 About the DocEnhanc...

  0.2 About the Data Stewa...

  0.3 How to use the online ...

  0.4 Reuse conditions

  0.5 About the teachers

  0.6 Contact information

  0.7 Acknowledgements

  0.8 Announcements

˅ **1. Introduction**

  1.0 About: Introduction

  1.1 The importance of res...

  1.2 Transparency and ope...

## ˅ 0. Welcome

Collapse all

The online Data Stewardship course provides an introduction to research data management. It has been created within the framework of the international, EU funded project DocEnhance project by a working group of research data management specialists at UiT The Arctic University of Norway. It is provided under CC BY 4.0 license.

The main target group for this course is PhD candidates at universities, research institutes and university colleges. It is primarily designed to function as a preparatory task for interactive seminars with peers, as well as collaborations with partners from the non-academic sector. It may equally well function as an independent teaching and learning resource, and the course is therefore open for anyone who wishes to improve their competences and skills in research data management.

The course can be taken at any point of time or place. To gain access to the final exam, which enables you to receive a certificate, please enrol in the course.

How to enrol in a course in NTK Moodle

Registered NTK patrons can register by first logging into Moodle using their NTK credentials (upper right corner - *Log in - Log in using your account on: NTK Shibboleth*) and then clicking the "*Enrol me in this course*" option from the course's main menu, confirming with the blue "*Enrol me*" button.

If you are not registered with NTK, first fill in this form. After confirming your email address, log into Moodle (upper right corner - *Log in* - enter *Username and Password - Log in* button) and then click the "*Enrol me in this course*" option from the course's main menu, confirming with the blue "*Enrol me*" button.

If you have any questions about this course, please contact us at: reference@techlib.cz.

31

# How to transfer the course to Moodle

More info at **DocEnhance platform**: https://courses.docenhance.eu/

- NTK support for HEIs, contact NTK Academic Services: reference@techlib.cz

- NTK website: a special webpage which information about downloading all 3 Modules + other DocEnhance courses is in preparation.

- Each module already contains tutorials and texts for trainers, assignments, quizzes, including certificate template.

- MBZ files (Moodle format) are easy to upload to the Moodle interface.

- Any Moodle administrator should be able to do this.

# Modul / Course certification

- Universities may use the template to create the Module / Data Stewardship course certificate.

- The local institution's logo can be included and add the name of the local signatory (certificate is not automatically uploaded).

- An additional plugin "mod_customcert" is needed to customize the certificate.

- The certificate should contain the EU and DocEnhance logos.

- Institution may also alter the number/type of credits (ECTS or other).

# More info (in Czech only)

National Czech Programme | eosc

Hledej ...    English

O nás    Pracovní skupiny    Sekretariát EOSC-CZ    Školicí centrum    **Novinky a akce**    Kontakt

⌂ › Novinky a akce › Kalendář akcí › Pilotování "Data Stewardship" kurzu pro doktorandy

## Pilotování "Data Stewardship" kurzu pro doktorandy

**23. listopadu 2023**
**9:30 – 14:00**

**online**

Kurz je zaměřen na úsek institucionální agendy, která se zabývá problematikou přenositelných dovedností v rámci doktorského vzdělávání. Cílem přednášek v rámci kurzu je předat účastníkům zejména z vysokoškolských institucí zkušenosti z pilotování kurzu "DocEnhance Data Stewardship" zaměřeného na správu výzkumných dat do kurikula doktorského studia na VŠCHT Praha a PřF UK. Kurz "DocEnhance Datastewardship" je přizpůsoben především potřebám začínajících doktorandů a kombinuje teoretický obsah s praktickým cvičením a možnou mezisektorovou spoluprací. Doktorandy provede všemi kroky správy výzkumných dat, od hledání relevantních dat až po publikaci datasetu. Jedná se o velice praktický kurz pro zlepšení povědomí o Open Science, FAIR, RDM a tím podporuje zlepšení integrity výzkumu již na začátku vědecké kariéry.

https://www.eosc.cz/novinky-a-akce/kalendar-akci/pilotovani-data-stewardship-kurzu-pro-doktorandy

# Thank you for your attention!

## Questions?

eva.hnatkova@techlib.cz