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D4.1 - European Curriculum for data stewards

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Deliverable Abstract

This deliverable is the final report of the work done by Task 4.1 of the Skills4EOSC, on building a curriculum for training data stewards. The curriculum is aimed at trainers/instructors of entry-level data stewards. The learning materials developed in this task are available on GitHub, and are linked within this report.

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The training curriculum development has been a highly consultative process and we have reached out to many colleagues and experts in our network. We would like to acknowledge their support. Even though they have not been part of the project, they have given us valuable insights by offering their expertise to review the minimum viable skillset for data stewards and parts of the training curriculum.

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1. Executive summary

1.1 Introduction

Task 4.1 of the Skills4EOSC project focused on developing a training curriculum for Data Stewards. This curriculum is based on the Minimum Viable Skillset (MVS) for data stewards, a document co-developed during the project, which outlines key skills and competencies required for a data steward role. Our goal in this task was to prepare a curriculum aimed at trainers who would train entry-level data stewards, the ultimate target audience of this curriculum. In this report we explain our thinking and methodology behind the curriculum development, and also link to the material, hosted on GitHub to maximise its openness and reusability.[1]

The curriculum has been finalised through a landscaping exercise as well as conducting a gaps analysis and building upon an existing training offered by Research Data Netherlands, 'Essentials 4 Data Support'.[2] The curriculum has been developed and finalised through a continuous consultative process with Data Stewards and other experts from across Europe.

1.2 Curriculum Design Process

The curriculum design process has consisted of the following steps. Each step is discussed in great detail in the report.

- **Minimum Viable Skillset (MVS)**

  The MVS for Data Stewards was co-developed and served as the guidance for the detailed curriculum development.

- **Defining the target audience**

[1] Whyte, A. and D. Green. Data Steward: Minimum Viable Skills Profile. Zenodo, 14 Feb. 2025, doi:10.5281/zenodo.14865959.

[2] "Essentials 4 Data Support Course." Researchdata, https://researchdata.nl/en/services/cursus/. Accessed 14 Apr. 2025.

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The curriculum scope is for aspiring/entry level Data Stewards. There is sufficient breadth for an instructor to tailor it for different institutional/local contexts.

- **Landscaping and Gaps analysis**

  Conducting a landscaping exercise and gaps analysis of already existing materials/courses across Europe.

- **High level topics**

  High level topics were developed first and brought to the community for their input before the curriculum was expanded with more details.

- **Pilot**

  A pilot training was conducted using one module and analysing feedback from the pilot. Details of the pilot are presented in this report.

- **Expanded curriculum with sections and modules**

  There are a total of 8 sections, with each section further divided into modules to cover the most important sub topics within each section. The curriculum is accompanied by learning objectives, module duration, learning activities, materials to prepare, instructor notes and resources.

There has been continuous consultation throughout the process of curriculum development.

1.3 Collaborating with other Project Tasks

The work of this task was impacted by the final outcome of other tasks and their deliverables:

- Task 2.1: Minimum Viable Skillset for Data Stewards
- Task 2.3: Fair-by-Design Methodology[3]

[3] Filiposka, S., et al. D2.2 Methodology for Fair-by-design Training Materials. 1.4, Zenodo,

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- Task 2.4: Learning materials quality assurance and certification framework[4]
- Task 2.5: Recognition Framework for learning materials quality assurance[5]
- Task 4.2: Learning Paths for Data Stewards[6]

1.4 Internal Review Process

The final deliverable report and complete curriculum has been reviewed by two internal reviewers from the project, listed above. The main findings from their review is summarised and the changes that have been incorporated as a result have been highlighted.

1.5 Final Deliverable

The final curriculum consists of the following sections:

- Research Data Management
- Research Software Management
- Policy and Governance
- Usage Rights and Licenses
- Ethics
- Personal Data and GDPR
- Teaching and Education
- Transversal/Soft Skills

The complete training curriculum is available on our Github repository:

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31 Aug. 2023, doi:10.5281/zenodo.8305540.

[4] Quality Assurance & Certification Framework. https://www.skills4eosc.eu/resources/quality-assurance-certification-framework. Accessed 14 Apr. 2025.

[5] Bjerde, K. W., et al. D2.8 Skills4eosc Recognition Framework - Final Version. Zenodo, 28 Feb. 2025, doi:10.5281/zenodo.14933037.

[6] Wildgaard, L., et al. Milestone: Pilot Learning Path for Data Stewards. Zenodo, 13 Aug. 2024, doi:10.5281/zenodo.13309349.

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https://github.com/Skills4EOSC-DSCurriculum/DataSteward-Training-Curriculum

And also the associated Github pages:

https://skills4eosc-dscurriculum.github.io/DataSteward-Training-Curriculum/latest/7%20Teaching%20and%20Education/

The repository will contain a link to the most updated version of the materials, which is open and free to reuse in accordance with the CC-BY 4.0 license.

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2. Curriculum Design Process

Figure 1 below outlines the curriculum design process, which consisted of the following steps:

This process of development and reiteration was supported by continuous consultations with data stewards and experts from the field.

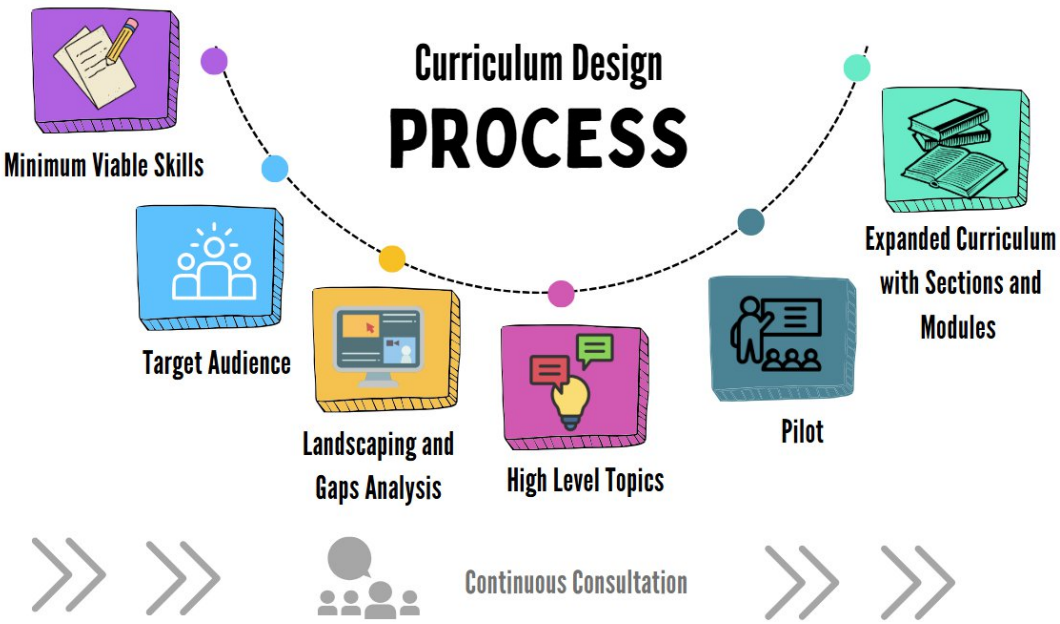

Figure 1: Curriculum Design Process

2.1 Target Audience

This data steward training curriculum is intended for instructors who wish to teach aspiring or entry-level data stewards. The curriculum is both comprehensive and modular, so that an instructor may choose as many sections (or if necessary, modules) as they like. There are many components to the curriculum that are intended to help guide the trainer in using the material, and provides helpful tips and activities to shape teaching and learning.

It would have been interesting to explore learning paths for intermediate or advanced level Data Stewards as well as discipline specific materials, but that is beyond the scope of this curriculum. However, a trainer could use this

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curriculum as a good basis and build upon it with their own material to address training needs that are suitable for their specific context.

2.2 Minimum Viable Skillset

The Minimum Viable Skillset (MVS) for Data Stewards was finalised in June 2023. This is a compilation of key skills and competencies required for data stewards developed within the Skills4EOSC project, and forms the basis of our curriculum. Feedback on the MVS has been gathered as follows:

- Feedback gathered on the content of the MVS
- Gaps analysis of existing Data Steward Curriculum against the MVS
- Feedback gathered on the high-level curriculum topics and learning objectives

2.2.1 Feedback gathered on the content of the MVS

Process

Between June and September 2023, the MVS was presented for Data Stewards through various Data Steward networks, including other stakeholders to gather feedback on the MVS and also on a curriculum for Data Stewards. Additionally, one-on-one meetings took place with data stewards from various countries to gather practical insights into their role.

A summary of all feedback was gathered and changes were made (or confirmed) to the MVS.

Methodology

The following were the broad questions asked during consultations via meetings and events (in some cases the MVS was shared in advance and in other cases parts of it were presented during the meeting):

- Understanding the profile of data professionals and their interest in the MVS
- What country context do you work in?
- The MVS distinguished between a 'Coordinator' and an 'Embedded' Data steward – was this division clear?

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- Do you identify as Coordinator or Embedded data steward (one or the other or both)?
- Do you relate to the main activities as listed in the MVS (for the Coordinator and Embedded Data Steward)?
- Do you relate to the essential skills and competencies of a Data Steward as mapped out in the MVS?
- Are the skills and competencies in the MVS a good basis for a foundational curriculum?
- Provide feedback on soft skills (what can be improved and included)?
- What skills do you use the most as a data steward?
- How do you use Open Science and related skills in your current role?
- What are some of the key challenges faced in your role?
- What trainings/courses/learning materials were used to help prepare you for your current role?
- What topics should be included in a curriculum for Data stewards?
- What is missing from existing foundational curricula/materials available?
- What would be some of the topics that would need to be covered in a course aimed at Data stewards that are entry level/practising or specialist Data Stewards?
- Do you have a PhD and do you think it is essential for the role?
- Do you work more with quantitative or qualitative research methods?
- Is it useful to have a registry of training/courses for data stewardship?

The following are questions we asked Data Stewards during one-on-one meetings:

- What is the day-to-day life/activity of a Data Steward?
- Do you have a background in the discipline/field you work in?
- What are the challenges of being a Data Steward?
- How did you come to this role? What is your background professionally?
- What skills do you use the most in your role?

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- How much do you deal with questions of open science/open access/FAIR data?
- What do you see as the next steps in your career? Would you need training/upskilling for this? Which would be some of the topics you would want to explore?
- What are some other terms you have come across in other institutional contexts that are similar to your role (for instance, data managers, data scientists, data librarians)?
- How is your role viewed in the faculty or institution where you work? Do people know where to find you?
- What is Data Stewardship in the context of your country?
- Are you part of a Data Steward community and which one?

Critical friends, who included stakeholders in our network who had demonstrable expertise in this topic, were made aware of the development of the Minimum Viable Skillset and that it would be used to develop curriculum. The MVS was shared with them and they were asked to provide written feedback.

Summary of Findings

A high level summary of all the feedback is as follows that informed changes to (or validated) the MVS:

- The MVS was split into two roles, the Embedded DS and the Coordinator DS. Data Stewards confirmed that they identified as either, or a mixture of both roles. This validated the breakdown of the MVS into two Data Steward roles. There was some discussion on why the Data Steward role was split into two, but given the diverse nature of data stewardship currently across Europe, opinion was divided. It was decided to keep the MVS with two types of Data Steward roles, although competencies and skills were the same for both roles.
- Initial terminology of the two Data Steward roles was found to be confusing – the MVS was updated and eventually finalised as Embedded Data Steward and Coordinator Data Steward roles.

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- Some of the stakeholders we consulted requested an introduction to the MVS including a glossary of terms. The MVS was updated based on this feedback.
- The importance of soft skills was stressed in almost all consultations (for instance, communication, analytical skills, training/pedagogical skills). The curriculum is being developed to address soft skills as identified in the MVS.
- Popular topics for curriculum (that were considered not addressed in sufficient detail in available materials) highlighted as: Ethics, FAIR principles, GDPR and privacy, Research Data Management (quantitative vs. qualitative RDM), Research Software Development and Management, Metadata/ontologies standards, Managing large scale research projects.

2.2.2 Gaps analysis of existing Data Steward Curriculum against the MVS

Process

The current curriculum for data professionals offered in the Netherlands, 'Essentials 4 data Support', was reviewed against the MVS for gaps.

Methodology

The gaps analysis conducted on the Essentials 4 Data Support was carried out by Skills4EOSC Task 4.1 members in sub-groups. Each sub-group analysed one topic of the Essentials 4 Data support against the MVS and identified what was missing.

Summary of Findings

A high level summary of the gaps analysis is as follows:

- Clearer presentation/course organisation
- More reader instructions for better clarity/understanding of topics
- More detail to be included as some topics from the MVS are missing
- Inclusion of more European examples, less Netherlands centred

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- Use of practical examples/case studies (real life material)/more 'how to' content

The gaps analysis exercise was useful as it validated that the MVS was comprehensive. There was no point raised that required further tweaking of the MVS.

2.2.3 Feedback gathered on the high-level curriculum topics and learning objectives

Process

Based on the MVS and the gaps analysis, a draft curriculum outline was developed with high-level topics and learning objectives.

Methodology

The draft curriculum outline was shared with a range of Data Stewards for their feedback as well as with critical friends (in this case contacts within our network of other data stewards in Europe or those who are experienced in providing similar support to researchers). The results of the feedback were summarised and discussed with the working group.

Summary of findings

Through the consultations (Figure 2 is an example) we gathered the following comments and feedback which we considered when finalising the outline.

- How will discipline specific support be incorporated?
- Current form seems to be quite natural and technical sciences and need an eye from the social sciences
- Discussion around depth of curriculum (how comprehensive should the curriculum be?). Many stakeholders felt that more depth and detail was required in learning materials.
- Emphasis needed on the importance of community management and data steward communities (being part of Data Steward communities)

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- Data stewardship is quite different in different countries so what is our broad definition of Data Steward at the onset of the curriculum and making this clear
- Transversal/soft skills are very outcome focused - not focused on personal development
- Community building – it could be added but for now it seems to be lost in the 'management' section

Figure 2: Example of feedback during a community consultation

2.3 Landscaping and Gaps Analysis

To design a curriculum aimed at professionalising the role of data stewards within Task 4.1, it was essential to familiarise ourselves with existing resources. The purpose was to reuse and harmonise materials where possible rather than 'reinventing the wheel'.

Landscaping consisted of conducting a (non-exhaustive) landscaping exercises of already existing courses, as well as curricula that have been adopted by institutions. The landscaping process consisted of desk research enabling the members of our task to be more autonomous in their research and to diversify the results obtained from across Europe.

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2.3.1 Methodology

A comprehensive table with results from the landscaping was made. This includes details on Data Steward training materials and courses that we found being offered in different parts of Europe. Our task members were invited to add the resources they found, examine them, and fill in metadata describing each course or curriculum. These metadata included information on whether the training was freely accessible, whether it awarded credits (and if so, how many), as well as a brief evaluation of the resource. This evaluation allowed for a more precise qualification of the resource's quality, indicating whether it was only partially relevant or if its entire content was useful for harmonising within our curriculum.

2.3.2 Main findings

The landscaping was a good starting point to define the scope of our curriculum. We had a limited time frame in which to conduct this exercise and it was by no means an exhaustive list. Once we finished with this step, we used the findings to give us direction for our work. Below is a summary of our findings:

- A total of 34 resources were identified, covering a wide range of topics: research data management and sharing, FAIR principles, legal and ethical aspects, as well as dedicated tools and infrastructures. The courses were offered mainly by European and North American institutions, and these training programs came in various formats, including MOOCs, in-person courses, certifications, and practical guides. Some served as excellent introductory materials for beginners (for instance, Essentials 4 Data Support), while others provide more technical or discipline-specific expertise.
- The interdependencies previously identified with other tasks enabled this landscaping to provide material for Task 4.2, helping to reflect on and identify topics for developing a career path.

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- This process also enabled a review of existing materials and led to the selection of Essentials 4 Data Support (provided by RDNL) as the foundation for our curriculum.

2.3.3 Gaps Analysis

A gaps analysis was carried out using the Essentials 4 Data Support, combined with findings from informal interviews with Data Stewards.

The main findings were as follows:

- Data Stewards use a lot of soft skills (also called transversal skills in our curriculum) in their day to day work. (We incorporated this finding into our curriculum by conducting a mapping exercise of the current training course, and a list of transversal/soft skills was compiled and cross checked against the MVS).
- It would be good to include a section on research software support, which is gaining importance as a research output in its own right.
- Including examples from other parts of Europe would ensure that the final training curriculum is relevant Europe-wide. The entire curriculum gives guidance to instructors on how to tailor the materials for their own local context.

2.4 High Level Topics

The result of the landscaping and gaps analysis exercise resulted in 8 high level sections where each section was broken down into different modules to cover all aspects of the Minimum Viable Skillset for Data Stewards.

The sections and modules were shared widely Feedback from the data steward community and RDM experts f resulted in further fine-tuning of the modules.

2.5 Expanded Curriculum with Sections and Modules

In line with the Fair by Design Methodology adopted throughout the Skills4EOSC project (more details on this are in a section below), we adopted

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a Backwards Instructional Design method for the curriculum, expanding each module into teachable units. We begin with **learning objectives,** or what we intend for learners to learn from each module. In this we were guided by the action verbs in Bloom's Taxonomy,[7] so as to make the learning objectives as clear and actionable as possible. Modules could have one or more learning objectives, depending on the scope. Using the learning objective as our base, we then expanded onto other aspects of the module, including activities, instructor notes, and resources.

The next step was to expand the module with **learning activities**. The learning activities include what a trainer could use in the training to cover the given topic. A wide range of activities are suggested which include:

- Slide presentations/Lectures: a presentation or lecture from the trainer introducing the topic to the learners is often one of the first activities mentioned in the modules. We do not provide the slides themselves as we want the material to be adaptable to context, but we equip the trainer with resources to create the slides, and point to any existing lectures or material on the topics.
- Discussion/Reflection activities: These are meant to assess how learners have engaged with the material, and also enable them to reflect critically on it.
- Quizzes: Short quizzes to assess how learners have absorbed the content (usually self assessed, but trainers can choose how to use them)
- Role play activities: taking on roles (such as a data steward role) to work through various practical scenarios.

Based on suggested activities and content for a particular module, we identify what **materials an instructor may need to prepare** for the session (slide presentations, questions to guide a discussion). As our curriculum attempts to reuse as many existing resources as possible, we then tried to

[7] Bloom's Taxonomy - TU Delft Open Courseware. https://ocw.tudelft.nl/wp-content/uploads/Blooms-taxonomy-for-learning-objectives-TU-Delft-Sep-2019.pdf. Accessed 28 April 2025.

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link to helpful **resources** that can help curate the sessions. These could be used to design slide presentations, assign reading to the learners, pick up case studies for discussions and role play scenarios, among others. We also include **instructor notes** that the trainer could use to teach the module. Sometimes these are key takeaways or messages to impart, or suggestions to guide a particular activity, or a way to use a particular resource.

2.6 Pilot

An important aspect of the curriculum development was to ensure its usability. With regards to this, we built in a pilot as part of our milestone deliverable.

The pilot was organised by Karlsruhe Institute of Technology (KIT), who are members of our task. The training was developed and delivered by a Skills4EOSC fellow.

The aim was to pilot one module and invite broad participation from beyond the project, thus the training was offered in a hybrid mode to invite participation from beyond Germany. This resulted in a total of 39 participants joining face-to-face and online.

We evaluated the pilot with evaluation from the participants, but put more focus on gathering feedback from the perspective of the trainer and how the trainer used the materials to develop the training.

We also awarded open badges to all learners at the end of the training. This is part of the Skills4EOSC Recognition Framework (R5).

More information on the pilot and evaluation of the pilot can be found in the milestone report: Pilot learning path for Data Stewards.[8]

[8] van Leersum, N., et al. Pilot Learning Path for Data Stewards. Zenodo, 17 Dec. 2024, doi:10.5281/zenodo.14506356.

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In person participants at Karlsruhe Institute of Technology for the pilot training on Ontologies, 29 October 2024

2.7 Methodology

Before we developed the full curriculum we sought help from learning experts on a comprehensive storyboarding exercise.

The Delft University of Technology has a team of learning developers that are based in the Extension School of Continuing Education. One of the learning developers gave us advice on how to organise a curriculum sprint, including the use of a story board tool to unpack the different parts of the curriculum.

We used their developed resources[9] as inspiration to develop a detailed framework for our own curriculum.

[9] Plan – Online Learning HUB. https://onlinelearninghub.tudelft.nl/plan/. Accessed 14 Apr. 2025.

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2.8 Curriculum Sprint

From April 22 to April 24, 2024, some members of Task 4.1 attended an in-person meeting at Delft University of Technology. The primary objective of this meeting was to conduct a Curriculum Sprint, an intensive workshop where participants collaboratively worked on defining the details of the training curriculum.

The task leaders had prepared a Curriculum Sprint template in advance, designed to structure each module. Using this framework, participants aimed to develop and expand the learning objectives as thoroughly as possible.

Four groups were formed to work on specific sections of the curriculum: Soft Skills, Research Data Management, Policy and Governance, and Teaching and Education. After each sprint session, participants were invited to present their progress to the rest of the group, allowing for immediate feedback, easier identification of challenges, and collective problem-solving. Through several work sessions, participants successfully developed at least 3 modules per assigned section.

This meeting was also an opportunity to discuss the role and profile of data stewards in our respective institutions. Data stewards from Delft University of Technology joined Task 4.1 to share their experiences. Additionally, the Head of Research Data and Software presented the university's research data management services and the role of data stewardship at TU Delft. These exchanges provided valuable insights, enabling participants to further develop the curriculum with a more practical understanding of data steward activities.

The meeting concluded with a final presentation of the work produced by the different groups, establishing a solid foundation of content and methodology for the next stages of curriculum development.

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Curriculum Sprint – Working Groups

2.9 Curriculum Expansion

The work that was started at the face-to-face curriculum sprint meeting was brought back to all the task members who were divided into sub-groups. Each sub-group was allocated a section with the full set of modules in that section. Their goal was to expand the curriculum with details on a standardised template that was also used at the curriculum sprint.

The template consisted of the following sections: learning objectives, duration, content overview, learning activities, materials to prepare, resources, instructor notes and learning goals. By filling out this template with complete details, the sub-groups were able to get a better grasp of the materials to include in their section. This exercise helped to merge modules or expand modules, and bring the curriculum into a shape that made sense.

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2.10 Peer Review

Once the curriculum was expanded, we built in a peer review process. Our task members volunteered to review each others work on the expanded curriculum. Each module was reviewed and feedback was provided using the Peer Review Template (Appendix 1).

The peer review consisted of making sure the expanded curriculum was targeting entry level data stewards and still covering the minimum viable skillset for Data Stewards. Reviewers were then requested to take a closer look at the learning objectives, learning activities and instructor notes and provide feedback that would improve the module.

The Peer review feedback was then shared back with the original module authors and they were requested to update the module accordingly.

After this process, we now had a complete and expanded draft curriculum, which could be shared for a final feedback through a final round of consultations.

2.11 Constructive Alignment

Constructive alignment is the process of assessing whether the learning activities and training content align to the intended learning objectives. This was similar to the peer review process, but this time we hired an expert from the Extension School for Continuing Education, Delft University of Technology to review excerpts of the training curriculum and give us feedback.

The feedback led to updating the learning objectives, reviewing whether the learning activities were correctly meeting the intended objective and aligning the instructor notes so that potential instructors would have better input to use and tailor the training curriculum to their local context.

This additional step greatly improved quality of the final curriculum.

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2.12 Expert Review

In addition to constructive alignment, each section was shared with an expert outside of the project to review the content.

Their feedback ensured that the content is clear and that the individual modules reflect the objective of the section well.

2.13 Fair-by-Design Methodology

The curriculum has followed the fair by design methodology used throughout the Skills4EOSC project.

By following this methodology, we did our best to ensure learning materials are FAIR which makes materials of better quality, and that are usable for others. It also means we support the development of training and skills within the Open Science community.

2.14 Quality Assurance

We followed a Quality assurance framework developed in this project for the design of curricula and materials.

The QA indicators are organised in 4 sub-framework (Generic QA, MVS compliance, FAIR-by-design methodology compliance and ELSI sub framework) and 2 categories (essential and non-essential indicators) (R4).

2.15 Presentation to the Community

Over the course of the project, our task members have presented at various community events for input and feedback including the following:

- EOSC Task Force members
- Data Stewards and Research Support staff via the 4TU Community Event
- Data Stewards at TU Delft
- Data Stewards via the DSIG interest group

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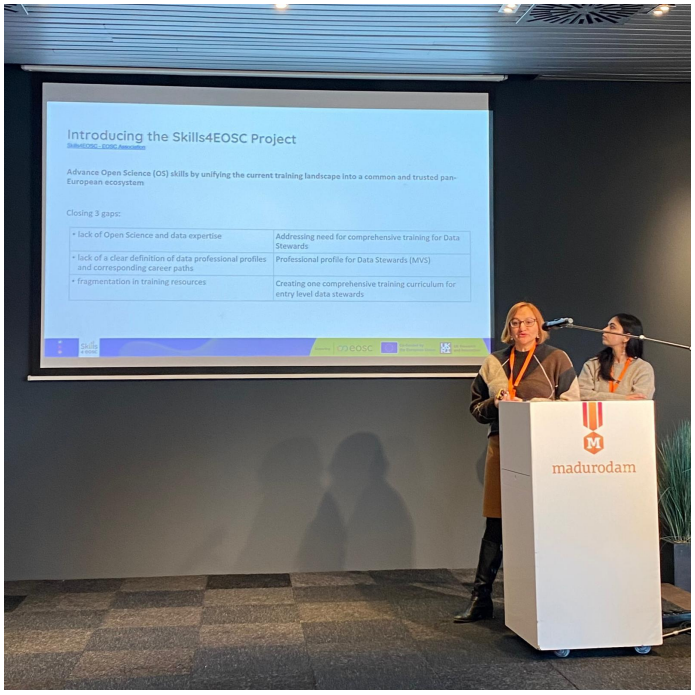
- (Aspiring) Data Stewards via a presentation at the Essentials 4 Data Support Course
- 10 year RDA webinar
- OS Fair, Madrid
- Competence Centre Network workshop, Skills4EOSC
- Data Steward Microcredential kick-off meeting, Ireland
- IDCC conference, the Hague
- National training and community platform for research data professionals, the Netherlands



Presentation at the IDCC conference in the Hague, the Netherlands 2025

2.16 Sharing the Final Curriculum

The final curriculum is on Github: https://skills4eosc-dscurriculum.github.io/DataSteward-Training-Curriculum/latest/

An overview of the curriculum is provided below:

Sections	**Modules**
Research Data	Module 1: FAIR Data

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Management	Module 2: Data Documentation and Storage Module 3: Data Organisation and File Formats Module 4: Data Curation Module 5: Data Preservation and Archiving Module 6: Data Sharing and Publication Module 7: Metadata Module 8: Ontologies Module 9: Data Management Plans
Research Software Management	Module 1: What is Research Software Module 2: FAIR Software Module 3: Software Management Plans Module 4: Software Development Practices Module 5: Software Sharing Practices
Policy and Governance	Module 1: Awareness of National/Institutional Policies on RDM, Open Science Module 2: Translating Institutional Data and Software Policy to Strategy Module 3: Balancing benefits of Open Science and Real-Life Data Related Obligations and Restrictions
Usage Rights and Licenses	Module 1: Getting Familiar with EU Copyright Law and Data and Digital

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	Legislation Module 2: Using and Sharing Research Outputs within a Multi-Layered Rules Framework Module 3: Commercialisation Assessments in EU Projects
Ethics	Module 1: Understanding Research Integrity Module 2: Ethical Guidelines and Legislations Relevant to Research
Personal Data and GDPR	Module 1: Strategies for Handling Personal Data Module 2: GDPR and Other Applicable Regulations on Privacy
Teaching and Education	Module 1: Lesson Development Module 2: Licensing and Copyright of Educational Materials Module 3: Facilitation and Engagement
Soft Skills	Module 1: Advocacy – Building Soft Skills for Impact Module 2: Mediation and Community – Liaison and Networking Module 3: Efficient Communication (Written, Verbal and Visual)

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3. Lessons Learnt

This has been an incredible journey and lots of lessons were learnt along the way which we would like to share as follows:

- Importance of defining scope: this was a lengthy process but once we had defined scope we were able to focus all curriculum elements on that scope.
- Involvement of task members: despite being spread out across Europe, we engaged task members by drawing on their strengths. We held monthly meetings and when necessary, we divided members into sub-groups. The final product is one born from the labour of collaboration and co-creation.
- The value of consultations throughout the process: we built continuous consultation and improvement into the process which was invaluable. It helped to validate the work we had done and consider feedback to cover gaps.
- The need for piloting: we conducted one pilot but given limited time, we were not able to conduct more. It would have been useful to pilot other modules of the curriculum.
- Alignment: as we are a diverse group, it is a challenge to align the tone/content look and feel across each module. This is also the strength of the curriculum because it draws upon resources and examples from a range of contexts.

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4. References

No	*Description/Link*
R1	White, A.and D. Green. Data Steward: Minimum Viable Skills Profile. Zenodo, 14 Feb. 2025, doi:10.5281/zenodo.14865959.
R2	“Essentials 4 Data Support Course.” Researchdata, https://researchdata.nl/en/services/cursus/. Accessed 14 Apr. 2025.
R3	Filiposka, S., et al. D2.2 Methodology for Fair-by-design Training Materials. 1.4, Zenodo, 31 Aug. 2023, doi:10.5281/zenodo.8305540.
R4	Quality Assurance & Certification Framework. https://www.skills4eosc.eu/resources/quality-assurance-certification-framework. Accessed 14 Apr. 2025.
R5	Bjerde, K. W., et al. D2.8 Skills4eosc Recognition Framework - Final Version. Zenodo, 28 Feb. 2025, doi:10.5281/zenodo.14933037.
R6	Wildgaard, L., et al. Milestone: Pilot Learning Path for Data Stewards. Zenodo, 13 Aug. 2024, doi:10.5281/zenodo.13309349.
R7	Bloom’s Taxonomy - TU Delft Open Courseware. https://ocw.tudelft.nl/wp-content/uploads/Blooms-taxonomy-for-learning-objectives-TU-Delft-Sep-2019.pdf. Accessed 28 April 2025.
R8	van Leersum, N., et al. Pilot Learning Path for Data Stewards. Zenodo, 17 Dec. 2024, doi:10.5281/zenodo.14506356.
R9	Plan – Online Learning HUB. https://onlinelearninghub.tudelft.nl/plan/. Accessed 14 Apr. 2025.

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Appendix 1 - Peer Review Template

Name of **module** reviewed:

As you review each module, please rate the following as best as you can and provide comments (where possible)	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
The content of the module is aimed at entry level Data stewards	☐	☐	☐	☐	☐
Do you have any detailed feedback on the content and how it can be better aimed at entry level Data Stewards?					
The learning content meets the learning objectives for each module	☐	☐	☐	☐	☐
Provide feedback for improvement on learning objectives/content:					
The learning activities are engaging and well connected to the objective of each module	☐	☐	☐	☐	☐
Provide feedback on learning activities (if any):					
The resources provided give a trainer sufficient possibility to 're-use' materials and prepare a training on this topic.	☐	☐	☐	☐	☐
Provide feedback on resources (if any) or if you know of additional resources that could be re-used for the modules of this section.					
The instructor notes are detailed enough and provide guidance on when to incorporate the local context within the training.	☐	☐	☐	☐	☐
Provide comments (if any) on the instructor notes:					
The module is well connected to what is covered in the MVS for Data Stewards	☐	☐	☐	☐	☐
If there anything from the MVS that is not covered in this module, please indicate this: D2.1 Catalogue of Open Science Career Profiles - Minimum Viable Skillsets (zenodo.org)					
Please provide any overall feedback that will help the sub-group to strengthen and finalise this module.					

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