EOSC-Life: Building a digital space for the life sciences

D9.1 – Final report of analysis of the training needs of different EOSC-Life users

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Executive Summary

This deliverable reports on the outcome of Task 9.1 "Analysis of the training needs of different EOSC-Life users". An online survey was developed to get structured feedback on the training landscape from the Biological and Medical ESFRI research infrastructures (BMS RIs). One of the aims was to identify gaps in existing training offers and developing a plan on how to address these gaps. 35 responses were received, from 13 research infrastructures (RIs). All 13 RIs provide training as part of their activities, which is a great starting point for the EOSC-Life training strategy.

The training needs with respect to EOSC-Life topics were analysed, which RI(s) expressed interest in the training topic, which RI(s) already provide training and which RI(s) are interested in providing training in the future. The survey results underline that the 12 pre-selected topics in the grant proposal cover the EOSC-Life training needs extremely well. However, the survey also highlighted that there is a need for outreach and awareness raising about EOSC in general, and EOSC-Life specifically, to RI staff within and outside of the project. In addition training needs were collected from the other EOSC-Life WPs and discussed during the project retreat in October. As a next step, we will facilitate that training in high demand areas will be expanded, e.g. by facilitating exchange of experience between RIs that expressed interest in providing training in a given topic with those already providing this training. In addition, as response to a high demand of introductory training on EOSC-Life and the clear need for EOSC-related outreach, a Translator group was initiated.

Project Objectives

Training of staff and users has been identified as an important component for reaching the following EOSC-Life objectives:

   a. Objective 1: Establish EOSC-Life by publishing FAIR life science data resources for cloud use
   b. Objective 2: Create an ecosystem of innovative life-science tools in EOSC
   c. Objective 3: Enable ground-breaking data driven research in Europe by connecting life scientists to EOSC

With this deliverable, the project has established the necessary foundation for a successful and impactful implementation of training activities.

Detailed Report on the Deliverable

The mandate of WP9 is to develop and deliver training to enable effective data access and preservation for immediate and future sharing, and re-use, of data in the Biological and Medical Sciences, for end users and RI staff. To ensure that EOSC-Life training develops and delivers targeted training, Task 9.1 "Analysis of the training needs of different EOSC-Life users" analysed the training needs of (i) the BMS RI (data) staff and (ii) the end-user of the (data) services that are required to establish the EOSC.

As a first step, an online survey was developed to get structured feedback from a high number of involved RIs. The results of the training needs analysis are used to identify gaps in existing training offerings and developing a plan on how to address these gaps. This could include training organised by WP9 members, training organised via the WP9 open calls, and by other EOSC-Life WPs.

The core of the training needs analysis was an online survey distributed to all BMS RIs. To get additional input, WP9 initiated the following activities.

- A session on training needs during the EOSC-Life retreat in October 2019

- In collaboration with WP10 and the Project Coordinator, WP9 organised a high-level "Translator Workshop" in January 2020 to which representatives of all RIs and WPs were invited. The objectives were: i) to address the difference in knowledge, needs and drivers across RIs ii) to start a process of co-creating training & communication materials, and iii) to plan activities to match EOSC-Life efforts with RI needs.

- Nominated a WP9 member to be the "WP liaison" to another WP to facilitate the exchange on WP specific training needs and plans.

Noting that what is required to establish the EOSC will be different for different RIs and is a rolling target, the aim of this task is to define sensible first steps and highlight challenges.

Online survey

Survey design

During the kick-off meeting WP9 jointly developed the scope of the survey with three overarching elements

1. A section on the training landscape of the RIs involved in EOSC-Life
    The 13 RIs involved in EOSC-Life are highly diverse with respect to how the training is organised and who the target audience is. This section was dedicated to get a better understanding of the training landscape and whether individual RIs had already conducted training needs analysis .

2. A section on available training related resources
    In order to avoid reinventing the wheel, survey respondents were asked whether their RI/organisation had developed impact questionnaires, event aggregators etc. and whether they would be willing to share these resources

3. A section on EOSC-Life related training needs and trainings already offered or planned
    To ensure that the EOSC-Life training activities will match the needs of all BMS RIs and integrate existing training resources, we collected information with respect to which EOSC-related training topics were already offered by the RIs and the relevance of these topics to RI users.

Based on the agreed initial scope, the survey was designed and tested on a number of users before being widely distributed. Particular effort was made to ensure that the terms used were understandable across RIs and did not require specific prior knowledge of the topic areas or the EOSC-Life project.

The survey was opened in May 2019 and distributed to training contacts of each BMS RI. It was up to individual RIs to decide whether they provided one consolidated answer on behalf of the entire RI or whether they asked their members to provide individual answers. Responses were monitored, and reminders sent, to ensure that all 13 BMS RIs in the EOSC-Life project added their views.The survey was closed in September.

Before participating in the survey, respondents needed to consent to their answers being shared with the EOSC-Life consortium partners according to the EOSC-Life Privacy notice[1] and the SurveyMonkey

Privacy Policy[2], non-consent resulted in exclusion from the survey. Out of 68 responses to the consent question, one respondent did not consent to the privacy policy, of the remaining responses, 35 respondents submitted content.

Survey analysis and results

The analysis was driven by the task leaders. A face-to face WP9 meeting to discuss and provide final interpretation of the survey results and decide on the implications and next steps to be taken took place in Utrecht, 15th January 2020.

Information on respondents

In total, we received 35 responses; depending on the RI, we received either one or multiple responses (Figure 1).
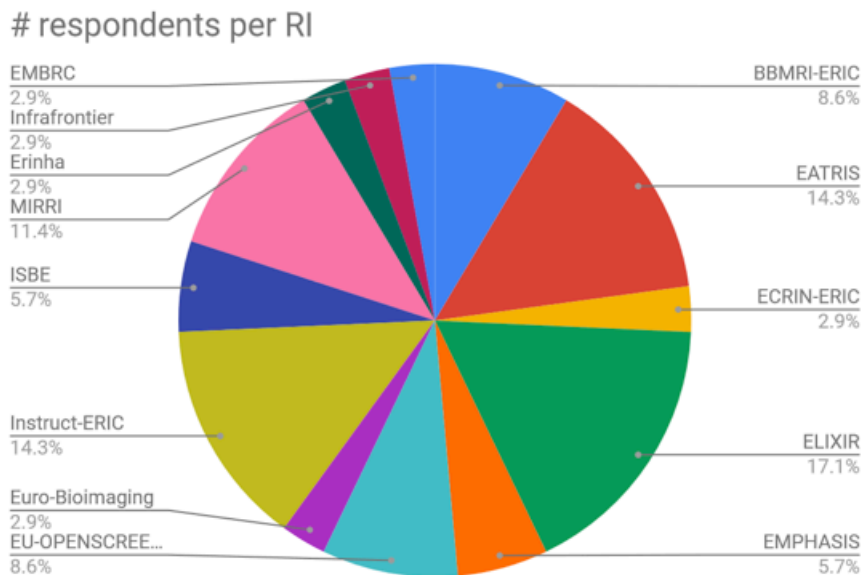

Figure 1: Graph showing the percentage of responses received for each Research Infrastructure.

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1 https://www.ebi.ac.uk/data-protection/privacy-notice/eosc-life-training-survey
2 https://www.surveymonkey.com/mp/legal/privacy-policy/

Each respondents was asked whether they were filling in the survey on behalf of the entire RI, the Hub (central coordinating unit/headquarters), Node (national coordinating unit), Centre (individual institute part of research Infrastructure) or Other (Figure 2). Together with the answers to the questions "Your role/position within the infrastructure" and "Do you work at the hub/node/centre?", this allows us to interpret the individual responses and potential inconsistencies between responses of the same RI.
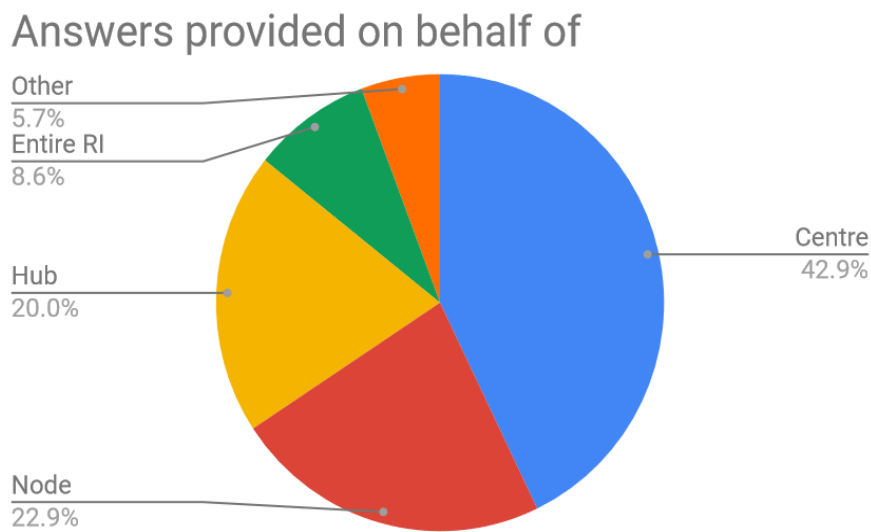

Figure 2: Overview of the RI entity the respondents represented, "Other" responses are either "as an individual" or as an "RI allied resource".

Respondents were asked to state the domain of their RI user(s) in terms they would identify with (e.g. microscopist, immunologist, bioinformatician, plant biologists). Responses to this question confirm that the landscape of RI users is widely covered in the responses to this survey; as you would expect since all 13 RIs responded (Figure 3). The only group that was noted to be absent was "Software Developers".
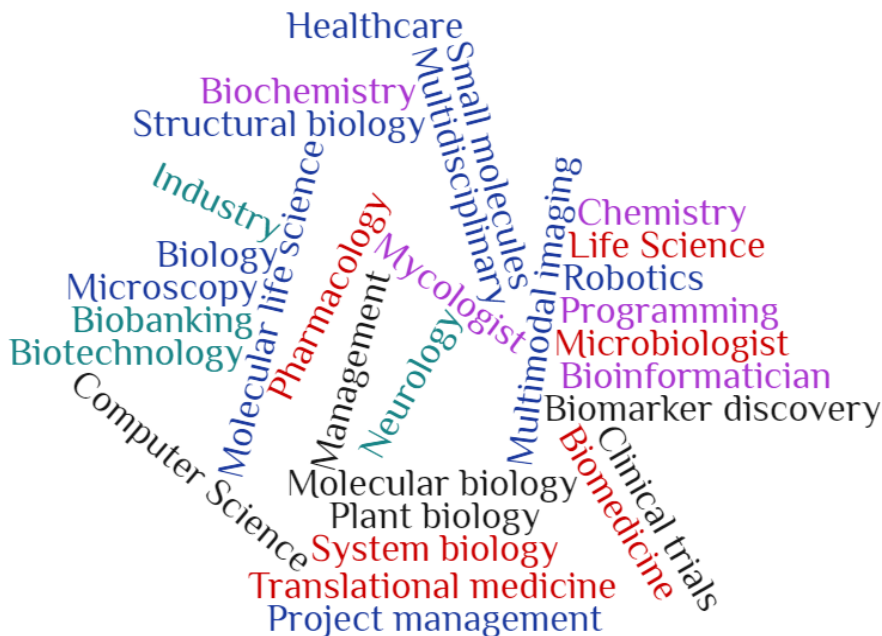
Figure 3: Word cloud of the responses when asked to state the domain of their RI user(s)

Results of the training landscape

The results of the survey confirmed that all 13 RIs provide training as part of their activities, which is a great starting point for the EOSC-Life training strategy.

When asked how their training offering was organised, 54% responded with the option "The hub (or other centre/node) coordinates all research infrastructure labelled training" and 77% responded with "Most Hub/Node/Centres run their own independent training programme" (Figure 4). The options are not mutually exclusive and respondents could select all that apply; 5 RIs have a model where both options are applicable.

Figure 4: Overview of the organisation of the training offerings
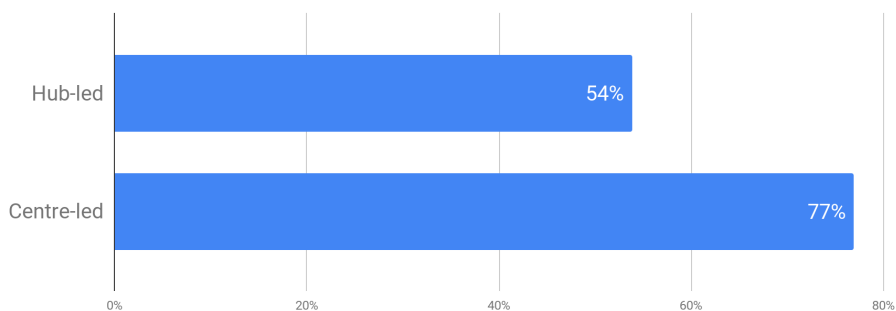
Unless otherwise specified, for the questions around the training landscape, the individual responses are not shown; instead the answers were aggregated at the RI level. Where multiple responses for the same RI are inconsistent, the answer from the Hub (or other central coordinating unit/headquarters) overrides the response from a node or centre, if the question

benefits from a strategic overview of all RI activities (e.g. Do you have an online catalogue or event listing space where you advertise training events to your infrastructure). Where the responses allow for multiple answer options, the widest range of responses is shown (e.g. which of the subgroups do you primarily target with your training programme - all responses are shown, regardless of whether the respondents are from the hub/node/centre).

Although all RIs offer training, it is important to understand what subgroup or career level each RI considers the primary target audience for their training programme (Figure 5). Multiple answer options were possible for this question. 69% of RIs consider 'Bachelor/Undergraduate' and 'Master' level students as part of their primary target audience; this percentage was higher than we expected. Similar 77% consider PIs as part of their primary audience, which again was higher than expected. There is quite a gap between Early (92%) and Experienced PostDoc (69%). The cause of this gap is unclear, it could be caused by the fact that more early PostDocs are applying for courses or that applications from early Postdoc are given priority over Experienced PostDocs if there is a selection process for the training. It is also unclear how the RIs assess the two different career stages and therefore whether the responses are reliable. Another explanation could be that the term "experienced Postdoc" is not used or their training activities are not specifically tracked. 46% of RIs target the full career spectrum; We expect that this rate might be higher and the percentage is an underestimation due to the above discussed underrepresentation of the term "Experienced PostDoc". An "Other, please specify" option was provided (data not shown) and selected by 31% of the respondents, upon analysis of the results it becomes clear that respondents have listed either groups that are included in the subgroups already listed (e.g. a particular group of RI staff), or options that can be clustered under "staff scientist or non-academic staff".
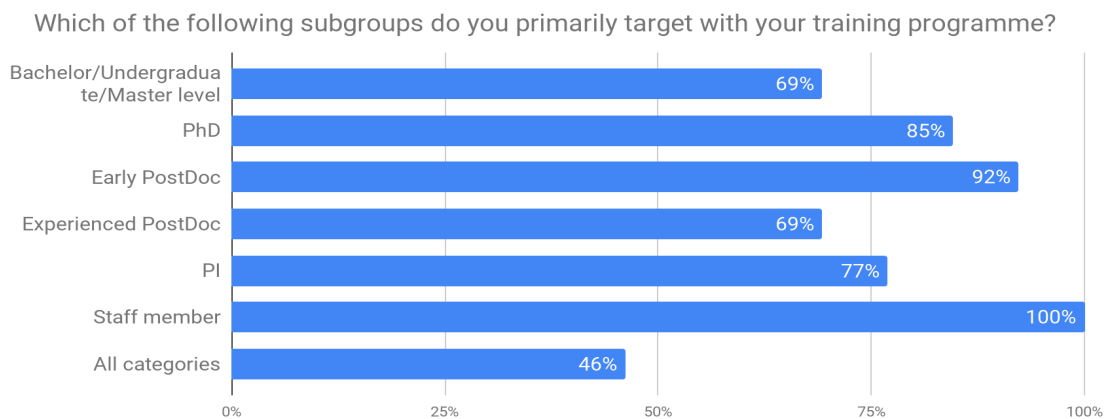

Figure 5: Analysis of the subgroups primarily targeted by the training programmes of the RIs. Respondents were asked to select all answer options that apply.

We were interested to know whether any of the RIs have conducted a systematic training needs analysis for their user(s), either one overarching needs analysis or several smaller analyses (Figure 6). 23% of the respondents replied that one overarching analysis was done, 46% that several smaller analyses were conducted, 15% had not conducted a needs analysis and 23% selected "Other". Specific responses under "Other" reflect that needs analyses are done by a training committee, national nodes or as part of project commitments.

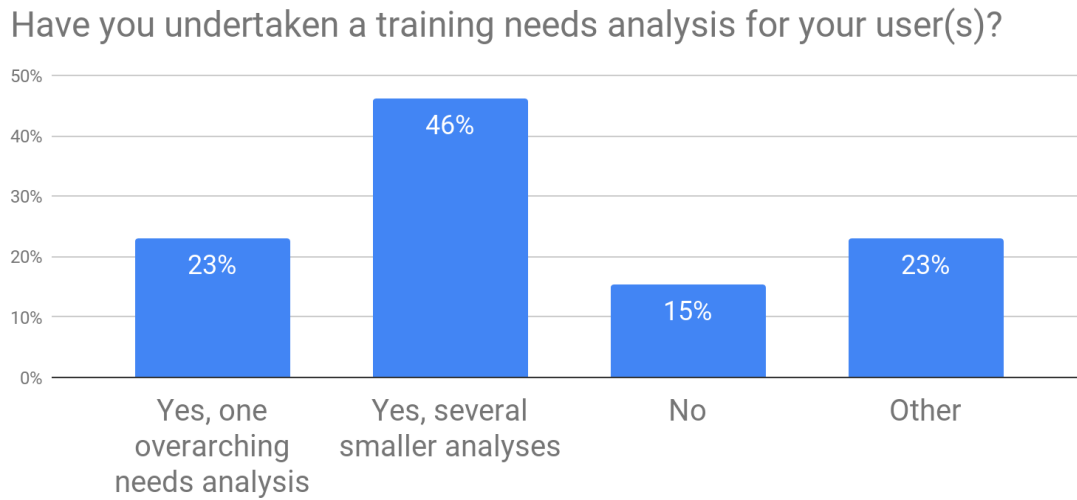## Have you undertaken a training needs analysis for your user(s)?

Figure 6: Overview of whether the RIs have conducted previous training needs analyses.

When asked which approach was taken for the needs analysis, respondents were able to fill in free text, common approaches were clustered and are presented below at the RI level. In many cases a combination of different approaches was taken. Figure 7 shows that a survey (70%) is the most common method used for the analysis, followed by discussion groups and dedicated workshops (50%), and course participant short-term feedback on training courses (40%). Less common methods are interviews (30%), competency profiles (20%) and ongoing tracking of user request (10%), the other approach mentioned was a needs analysis as part of a Market Analysis or Business plan.
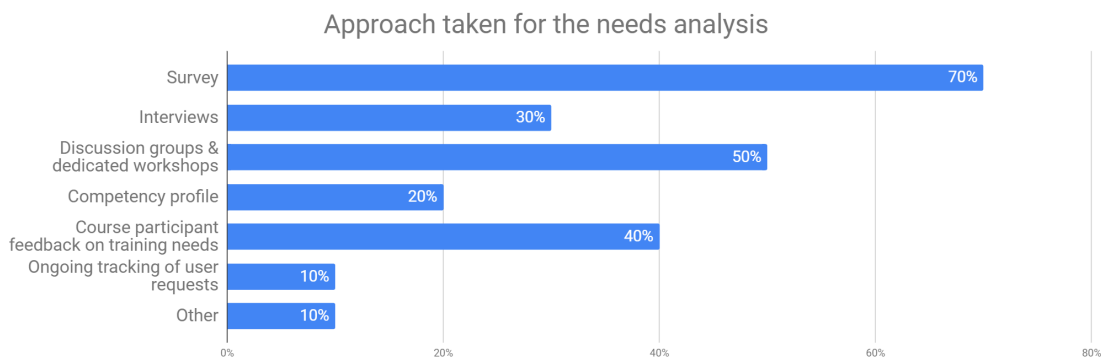

Figure 7: Overview of the approaches taken for the training needs analyses conducted by the RIs.

Results on available training related resources

In order to avoid the EOSC-Life project trying to reinvent the wheel with respect to setting up feedback forms or event aggregators, we also asked survey respondents whether their RI/organisation currently collects feedback from their training events, has an event aggregator or a directory of trainers and whether they would be willing to share these resources.

The vast majority of RIs routinely collect feedback from their training events (69%) (Figure 8), though only 45% has a standardised feedback survey (Figure 9). 15% of the RIs also assess the long-term impact of their training events. 23% responded that they currently do not collect feedback, but plan to implement this; note that it is unclear from how the question was asked

whether this refers to the post-course feedback, long-term feedback or both. 18% is not sure whether a standardised feedback form is used.

Do you currently collect feedback from your training events?

Response	Percentage
Yes: immediately post-course	69%
Yes: long -term impact assessment	15%
No, but we plan to implement this	23%
No	15%
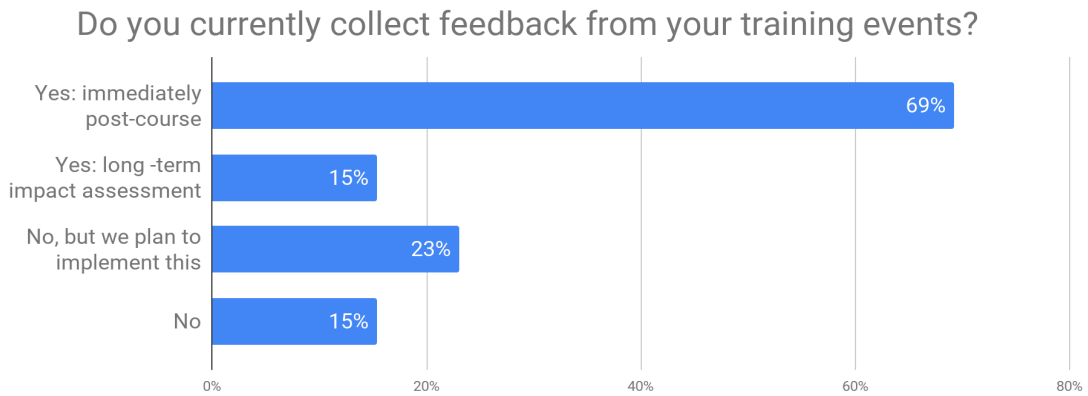
Figure 8: RI Feedback collection for training events

Do you have a standard feedback survey template

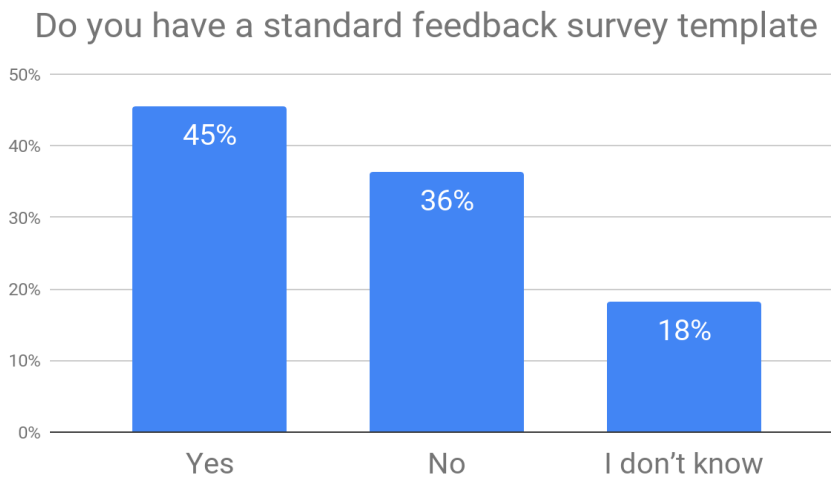| Response	Percentage
Yes	45%
No	36%
I don't know	18%

Figure 9: Response for RIs on whether a standard feedback survey is used to collect feedback for training events.

A catalogue or directory of trainers and their expertise is not routinely available, 31% of the RIs have some form of catalogue (Figure 10).

Does your RI have a catalogue/directory of trainers and their expertise?
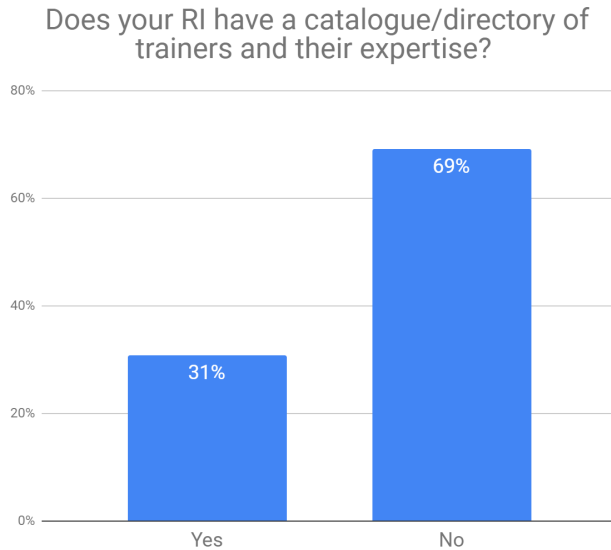

Figure 10: Availability of a catalogue or directory of trainers and their expertise in RIs

An online catalogue, or event listing space, where RIs advertise their training events to their users is more common; 38% of the RIs already have a catalogue in place and an additional 46% plan to implement one (Figure 11). For the RIs that have a catalogue, all but 1 RI (ELIXIR) manually add and curate the events in their catalogue and use free text keywords to tag the training resources in the catalogue. ELIXIR uses automatic scraping to add events to their catalogue uses ontology-driven keywords for tagging and is Bioschemas[3] compliant.
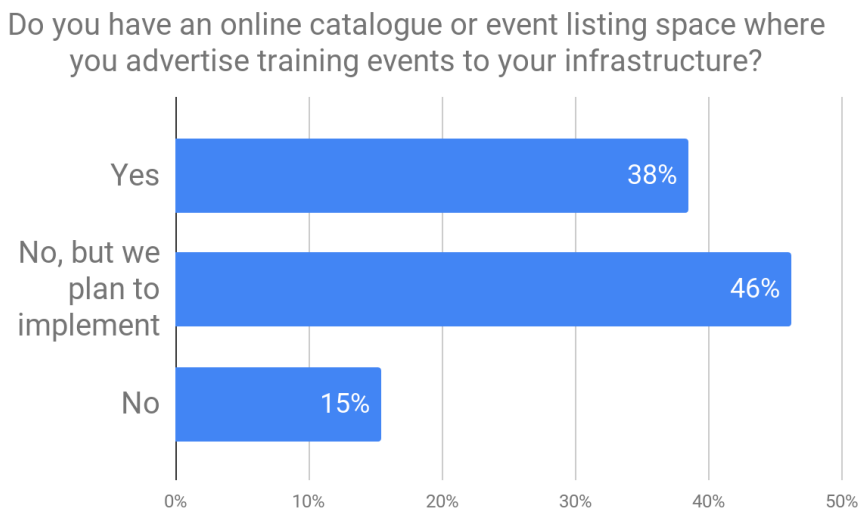
Do you have an online catalogue or event listing space where you advertise training events to your infrastructure?

Figure 11: The use of online catalogue or event listing space within RIs

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3 https://bioschemas.org/

Results on training needs & offers

To analyse the EOSC-related training needs and to match this to ongoing and planned training activities, respondents were asked to state, for 12 topics, whether their RI:

A. provides training in this area

B. doesn't provide training in this area, but would like to start

C. will not provide training in this area but the training is of interest to their users

Additional answer options included:

D. This is not / not yet relevant to our users / RI staff

E. I don't know the extent of the relevance to our users / RI staff

These 12 topics were based on the training activities described in the EOSC-Life grant proposal and training already planned by the technical work packages and refined by WP9 members.

1. Introduction to EOSC-Life for the general scientific audience

2. Data and metadata standards, ontologies and FAIR principles - for end users

3. Data and metadata standards, ontologies and FAIR principles - for technical users

4. Technical training on workflow composition and execution

5. Technical training on cloud deployment

6. Authentication and authorisation infrastructure (AAI) training for service providers

7. Cloud access management training for service providers (e.g. ARIA)

8. IT service management (e.g. FitSM)

9. Policies for data management

10. Tools for data management

11. Train-the-trainer

12. How to prepare a project for the EOSC-life OpenCall funding opportunities

For this part of the survey, we received answers from 31 respondents representing 12 RIs.

For each training topic, we then analysed which RI(s) expressed interest in the topic, which RI(s) already provide training and which RI(s) are interested in providing training in the future.

The analysis for the "Technical training on cloud deployment" (Figure 12) shows that currently only ELIXIR is offering training on this but an additional 4 RIs would be interested in providing training. The chart also shows that there is a diversity of training needs and offers within a given RI. For example 2 ELIXIR respondents already provide training, 1 would be interested in providing training and 1 expressed interest in the training topic per se. This spread reflects the diversity of the RIs across their nodes and centres.

Technical training on cloud deployment

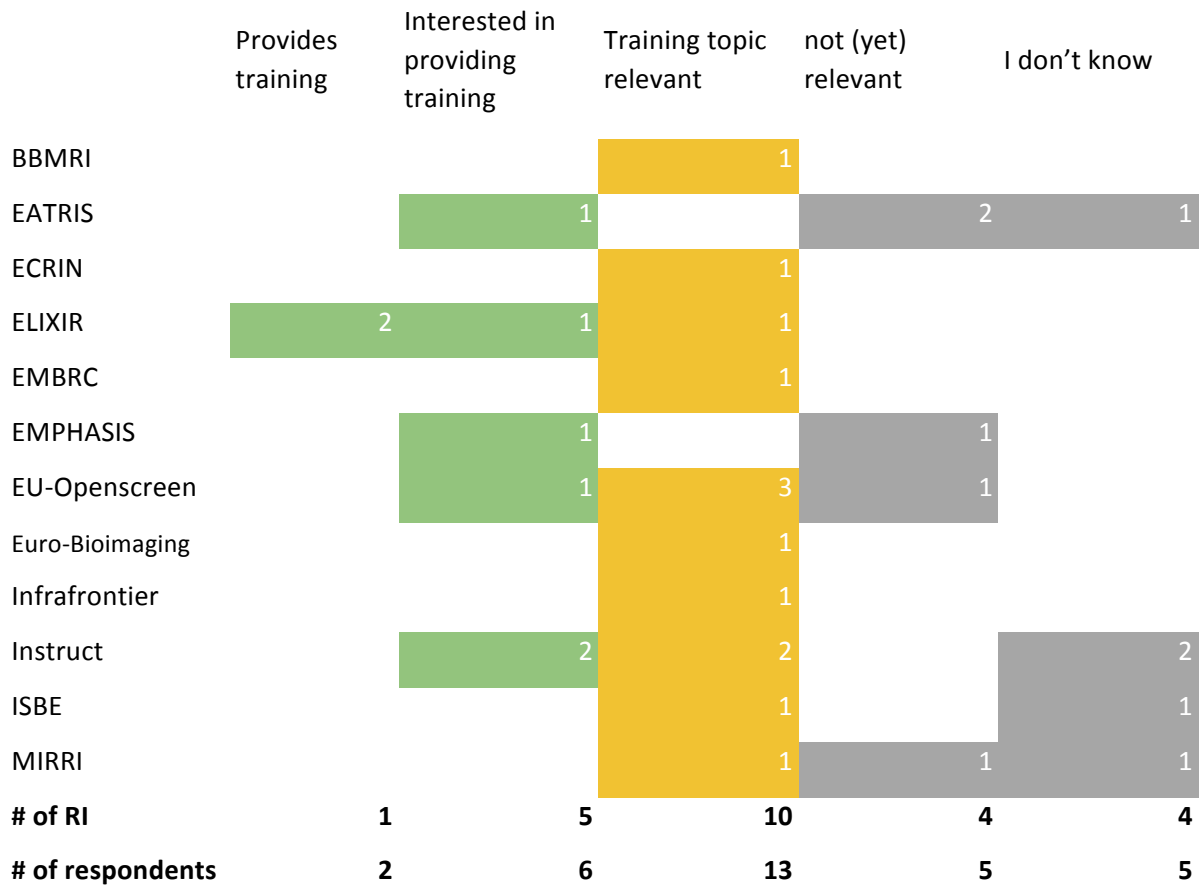|	Provides training	Interested in providing training	Training topic relevant	not (yet) relevant	I don't know
BBMRI			1		
EATRIS		1		2	1
ECRIN			1		
ELIXIR	2	1	1		
EMBRC			1		
EMPHASIS		1		1	
EU-Openscreen		1	3	1	
Euro-Bioimaging			1		
Infrafrontier			1		
Instruct		2	2		2
ISBE			1		1
MIRRI			1	1	1
# of RI	**1**	**5**	**10**	**4**	**4**
# of respondents	**2**	**6**	**13**	**5**	**5**

Figure 12: Map of training needs and offers for cloud deployment across the different RIs

If the RI chose answer option A-C for a given topic, the training topic was classified as relevant to the RIs (Figure 12). All of the 12 selected topics were relevant for at least 8 RIs. The topics listed as training needs by all RIs are:

1) Introduction to EOSC-Life for the general scientific audience

5) Technical training on cloud deployment

9) Policies for data management
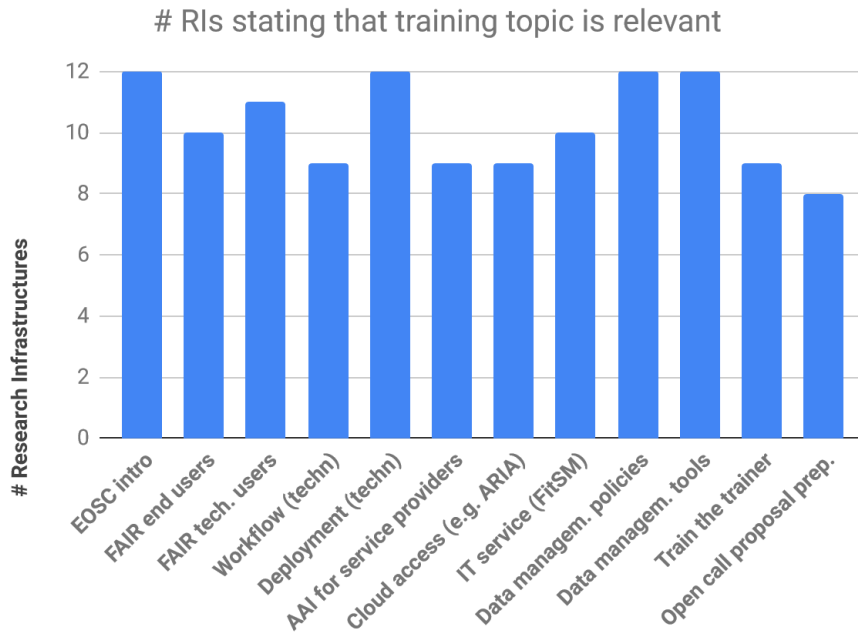
10) Tools for data management

Figure 13: Relevance of training topics for RIs, 12 RIs provided answers to this question.

The following chart (Figure 14) shows the number of RIs i) providing training (dark green), ii) interested in providing training (light green) and iii) interested in the training offer (orange) across the 12 training topics. Topics with a strong interest by "new" training providers are marked by an asterisk "*", training topics with a large gap between expressed interest and number of training providers are marked by a hashtag "#".
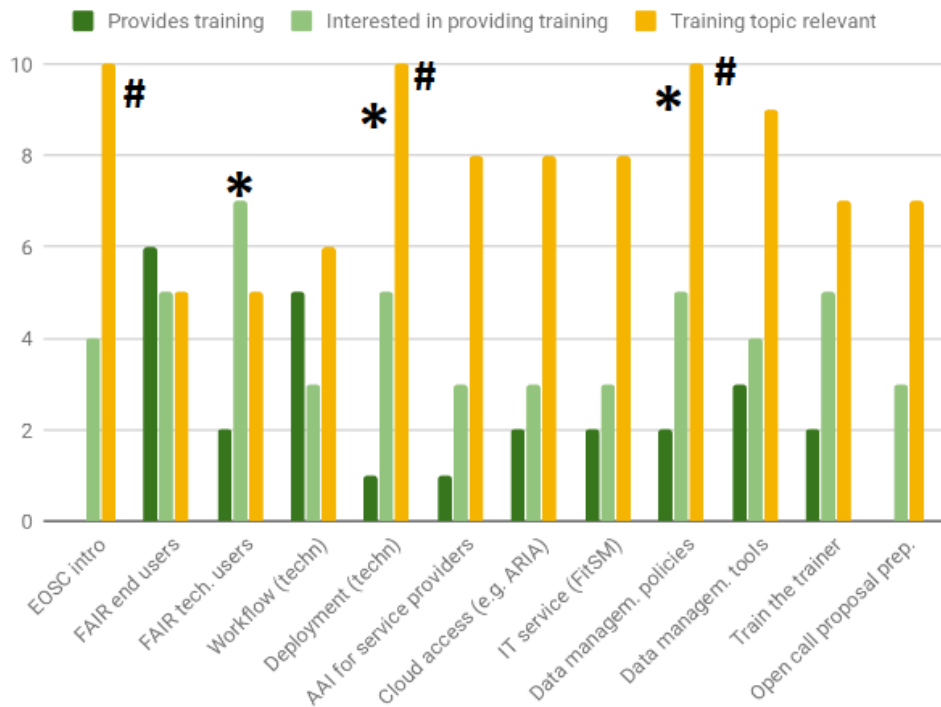
Figure 14: Number of RIs providing training, interested in providing training and interested in the training topic across 12 training topics.

Finally, respondents were asked to specify topics we have missed or if they were unsure of the coverage/audience of a mentioned topic. Only 3 responses were obtained, underlining that the 12 pre-selected topics cover the EOSC-Life training needs extremely well. When analysing the answers, one mentioned a topic not related to EOSC-Life, one stated that s/he did not understand many of the terms used above and one stated that "These topics are all of relevance to programmers; our audience are actual scientists using the facility." Especially the latter two responses underline that a subsection of RI staff is not well aware of EOSC-Life related topics and the overall need. This finding is another piece of evidence for the need for outreach and awareness raising about EOSC in general, and EOSC-Life specifically, to RI staff within and outside of the project.

Result from other activities to get input on training needs

Training needs session during the EOSC-Life retreat in October 2019

During this session participants were asked to identify challenges with respect to EOSC-Life, identify the underlying causes and potential solutions. This session, and the retreat overall, demonstrated a lack of common understanding of EOSC-life, the terminology used and exact objectives and activities for each WP across RIs and within and across WPs. To address this challenge it was decided to establish a group of "Translators" consisting of individuals representing RIs and/or WPs which will jointly work to establish a common understanding.

Translator group

The Translator group was initiated in collaboration with WP10, and the project coordinator, and a first workshop was organised in January 2020. The objectives were: i) to address the difference in knowledge, needs and drivers across RIs, ii) to start a process of co-creating training & communication materials, and iii) to plan activities to match EOSC-Life activities with RI needs.

During the workshop small groups analysed the EOSC-Life WPs descriptions and identified, for each WP, which Life-Science related challenge it addresses, what solutions to this problem it offers and which terms, key concepts or ideas need further explanation. Based on this analysis, each group started to identify what steps are needed in order to create a WP "pitch" that can be used to explain the value of each WP to a non-EOSC-Life expert e.g. some RI directors.

WP liaisons

Different WP9 members were nominated to be the "WP liaison" for each WP to facilitate the exchange on WP specific training needs and plans. This exchange proved helpful to keep track of training activities and understand the training needs of the WPs.

Overall analysis of training needs and next steps

The last section of the survey canvassed the availability and relevance of selected training topics for RI users. The next step will be to get in touch with the RIs that stated that they already offer training for some of these topics and understand exactly which audience the training is aimed at, and if the RI would be willing to share the learning resources, and expertise for this course or open the course for additional users from other RIs.

Depending on the feedback received from the RIs, different ways to increase the availability of courses across RIs, will be evaluated; this work will be executed through Tasks 9.2 and 9.3. One way forward would be to match RIs that already provide the training with the RIs who are interested in providing such training in order to either share resources, set up joint courses or facilitate another form of long-term collaboration. Another option to explore is to team up RIs interested in providing training to jointly develop course curriculum and materials.

The analysis of the survey needs will be shared with the respondents as well as with the EOSC-Life consortium to provide the technical work packages with RI level feedback on the relevance of the planned training.

The outcomes from the survey will be used to shape the Training Open Calls; although the calls are not going to be restricted to the topics covered by the survey they will be a potential way for RIs to jointly develop some of the courses covered by the survey. In addition, the responses about course feedback (Figure 8 and 9) have highlighted scope to standardise the way in which feedback is collected across the EOSC-Life partners; this work will be covered by task 9.4. Also, the responses about the training online catalogue or event listing space (Figure 11) have highlighted differences in the approach used to collate training events. This will be addressed by the establishment of a working group to discuss a common solution for EOSC-Life.

References

EOSC-Life Training Survey
https://drive.google.com/open?id=1kr1Azzqse3ip77rmCxLH99WNYxfQwrIQ

Abbreviations

BMS   Biomedical Sciences

RI   Research Infrastructure

WP   Work Package

Delivery and Schedule

The delivery is delayed:
  No
Adjustments made
  None