

PR2- Modelling the Career Guidance Software Report

Report Outline

1. Reassessment of the objectives of the initial project
2. Redefining the roles of the learner, teacher and industry expert in using the application
 - 2.1 The learner
 - 2.2 The teacher
 - 2.3 The industry expert
3. Dynamic mock-up and interface design
 - 3.1 Learner
 - 3.1.1 Onboarding
 - 3.1.2 Self-assessment
 - 3.1.3 Browsing the catalogue of occupations (exploration of and search for a target occupation)
 - 3.1.4 Browsing the catalogue of training
 - 3.1.5 User's Profile viewing
 - 3.2 Teacher
 - 3.2.1 Adding a training
 - 3.2.2 Assessing skills alignment between occupations and training offers
 - 3.3 Industry Expert
4. Proposed technical solutions to the incompleteness of the ESCO database

1. Reassessment of the objectives as defined in the initial project

PR2 was led by Sorbonne Université working directly with Bullini Enterprise Individuelle (Bullini EI), in collaboration with UNIMI. As discussed in the proposal, it consists in implementing the "smart" catalogue of offers (task 1, T1), in defining the specifications of the DRESKILL@U career guidance software (task 2, T2), and in building the dynamic model and designing the interfaces (task 3, T3).

Considering the results obtained in PR1, i.e. the work on skill alignment (skill gap analysis) and the design of the digital course catalogue (smart catalogue of offers), and after discussions with the consortium members, it was decided to reshape PR2 along the following lines: we must consider that there are three central users, as defined in PR1, the lifelong learners, the teachers/trainers and the industry partners. Therefore, due to the incompleteness of the PR2.T1 task ("The digital smart catalogue is a part of the application that will be used by the learner to search for training"), it was decided to restructure PR2 with two tasks T1 and T2.

PR2.T1 Defining the roles of the learner, teacher and industry expert in using the application (SU and Bullini Enterprise).

For completeness, the roles of the three actors must be considered equally in defining the tool. The tool is not only an assessment and a guidance tool for the learner. It also helps the teacher to "structure" his/her offer into a small volume of learning which can be verified through micro-credentials designed to provide the learner with specific knowledge, skills and competences (i.e. learning outcomes) that respond to societal, personal, cultural or labor market needs. Finally, via the D-Reskill@U application the industry expert qualifies the level of skills/competences needed for a given job/occupation, according to context (small, medium, large businesses; local vs international reach; junior vs. senior role etc.)

PR2.T2 Dynamic mockup and interface designing (Bullini Enterprise)

This section unites tasks T2 and T3 of the proposal, i.e. a presentation of the career guidance software specifications, the creation of the dynamic mockup (accessible through the three points of view of the learner/teacher/industry expert). The system was also partially tested by the SU team (9 professors/trainers) and during presentations made in the Learning, Teaching, Training (LTT) activities in Barcelona.

2. Redefining the roles of the learner, teacher and industry expert in using the application

2.1 The learner

The learner is a person that is searching for opportunities for reskilling (when the target occupation is in another field) or for upskilling (when the target occupation is in the same field), in order to get a new occupation (target occupation). The learner is confronted with the following use cases:

1. **A search for a targeted occupation.** The system will support the learner in searching for a target occupation, through the catalogue of occupations.
2. **Fill out a self-evaluation form.** Once the user chooses a target occupation, the system will ask him to provide a self-evaluation of the skills and knowledge needed for that occupation. The completion of the self-evaluation will fill the skill profile of the user. With this information the system can internally compute the skill-gap, id est, the missing skills (and knowledge) the learner needs in order to obtain a target job.
3. **Search for training in the (smart) catalogue.** The user searches for training in the catalogue, according to different criteria: skills provided by the training, knowledge provided by the training, pre-requirements (general requirements and requirements specifically stated in terms of skills and knowledge) and almost all the fields that describe a training.
4. **Evaluate offers and build your own path with training offers.** The user can interactively build his own path adding different training to it. This is performed letting the user pass from the training search page to the curriculum builder page. The system will take into account the skill-gap of the user in the search for training and the prerequisites in terms of skill and knowledge in the stacking of training into a path. This implies training information is already added to the system for each training, as we propose in the “add new training” feature for the teacher role. If the user decides to not add any information about his skills, the catalogue will not be able to customize the search and the listing of search results for the needs of the user. It will simply be a general catalogue, not customized on the skill of the user. The system will ask the users to evaluate their skills in particular before the building of the path and will notify them that without (self-) evaluation of their skills the path builder will not be useful.
5. **Consult (and build) skill profile.** The user can always access his/her profile (on top/right corner of the application). In this page they can check the information they added during the navigation of the application and can add and evaluate new skills.

2.2 The Teacher

The teacher adds training offers to the catalogue and/or uses the application to design training offers to ensure the offer provides all the skills required by a specific occupation. The teacher is confronted with the following main use cases:

1. Adding a training offer to the (“smart”) catalogue. Adding a training implies structuring a description of an existing real training in the form required by a skill-based approach (we follow the current version of the ESCO ontology). In particular the teacher should add 2 main types of information: general information, and skill-related information.
 - General information:
 - Practical information: (link of the course, language in which it is taught, etc.)
 - Education related information: ECTS courses,
 - Skill-related information (information expressed in term of competencies, skills and knowledge from a common reference)
 - Training prerequisite (if any)

- Learning outcome of a training, expressed using a skills-based approach

The application will help the teacher in filling-in the related information. For instance, it can propose certain known skills and knowledge as the user types in. This will help the teacher to transform the usual syllabus of a training into a Learning Outcome from a standard ontology for skill like ESCO.

2. Add a new training from an existing traditional training, which can be certified as a micro-credential. The system will help the teacher in converting/restructuring a training into one or more training which can assess the learning through micro-credentialing, using European Union mechanisms including the ECTS and a conversion table.

3. Add a new micro-credential training (from scratch). This is very similar to adding a new training, simply the system will take into consideration that a micro-credential has some standard nomenclature: like unit, course, program.

4. Assessing the skills alignment between an occupation and an existing training offer (set of training) in terms of skills and knowledge required. The teacher will be able to identify and visualize the missing skills and knowledge in the current training offer in order to provide a complete set of skills and knowledge required for a specific occupation.

5. The teacher can also remove or modify the training offers that he added in the first place. This feature is exploitable directly on the catalogue.

2.3 The Industry Expert

This role represents a person that will improve (by updating, tuning, modifying, and adding) the description of an occupation, in order to match it with the actual needs of the market, in a specific industry/sector.

The industry expert should be able to:

- set (or review if already existent) the proficiency levels of each skill and knowledge required to obtain an occupation or job (at a certain level, for instance junior vs. senior roles). He will make use of a common scale (see PR1 report).
- set (if needed) each specific skill and knowledge, required to obtain an occupation as mandatory or optional. He can also add skill and knowledge not actually existing in the proposed database, based on ESCO's ontology.

When the user will log in into the system, he can search for a specific occupation and the system will provide them with the current list of skills and knowledge (essential and optional) needed for that occupation. Note that proficiency levels are not available in any known database yet. The summary of use-cases that were identified are given in the annex.

Many functionalities, particularly the catalogue of training and the skill gap, can benefit from the concept of skill alignment and the distance between training and skill sets. For example, two trainings (or two occupations) can be considered closer if they share a significant group of skills, compared to two trainings (or occupations) that offer different skill groups. The PR1 report explains how to compare entities such as

occupations, training, and user profiles in terms of proficiency levels, and it provides a preliminary estimation grid

3. Dynamic mock-up and interface design

In the context of user experience of software systems, a dynamic mock-up of an application is an interactive visualization of the application where its user can only navigate through some preconceived and fixed paths. It is filled with pre-constituted example data and there is no actual software application involved. It gives an idea about the future application, in terms of the design of the pages (including colours, graphical components) and the user flows of the main functionalities.

The following paragraphs will present a graphical representation of the user experience, based on static views from the dynamic mock-up. It will be split into the three different types of users that can interact with the system.

3.1 Learner

To explain the functioning of the dynamic mock-up and account for the UX of the learner we have selected successive screen copies corresponding to the various steps (i.e. use cases) to which the learner is confronted, that is onboarding, self-assessment, browsing the catalogue of occupation, browsing the catalogue of trainings, and user's profile viewing.

3.1.1 Onboarding

After registration, the application poses some fundamental questions to the user, particularly regarding his current occupation and his desired future occupation, as shown in the figure below.

The screenshot shows the 'Last step' of an onboarding process. At the top left is the logo for 'D-RESKILL@U' with the tagline 'Digital Building at Universities'. The page title is 'Last step'. A green bar at the top right says 'for now'. The form contains three questions:

- How many years of work experience do you have? (Answer: 4 ans)
- How many years have you worked in the field in which you have studied? (e.g. you are a data scientist and you studied data science) (Answer: 4-6)
- Please identify a target job or occupation: (Answer: Analytical chemist)

At the bottom, there is a search bar containing 'Analytical chemist', a 'Confirm' button, and a link: 'I don't find my target job occupation >'. The entire form is set against a light green background.

As compliance with the General Data Protection Regulation (GDPR) is a standard requirement, the application will be fully GDPR-compliant. Users will be informed about how the platform intends to use their data, all their rights in terms of privacy, and how to exercise these rights on the platform. Specifically, users will be able to express their consent regarding the use of their data and for what purposes. This focus on functional features specific to the domain ensures that user data is handled with utmost care and respect for privacy.

3.1.2 Self-assessment

After completing the onboarding process, the application will lead the user to a self-assessment form, as illustrated in the following image. Users have the option to click on a skill to indicate their proficiency in that particular area by clicking on the stars positioned on the right side of the skill. Furthermore, users can access a comprehensive skill definition by hovering their mouse over the respective skill and also gain access to detailed information about the skill.

The upper section of the form offers users guidance concerning the criteria for self-evaluation.

ANALYTICAL CHEMIST

self-assessment form

- ★ Beginner (limited experience) ^
- ★★ Intermediate (practical application) ^
- ★★★ Advanced (applied theory) ^
- ★★★★ Expert (recognized authority) ^

ESSENTIAL SKILLS (required for the occupation)

Analyse chemical substances	★★★★
Apply for research funding	☆☆☆☆
Apply research ethics and scientific integrity principles in research activities	☆☆☆☆
Apply safety procedures in laboratory	☆☆☆☆
Apply scientific methods	☆☆☆☆
Apply statistical analysis techniques	☆☆☆☆
Communicate with a non-scientific audience	☆☆☆☆
Conduct research across disciplines	☆☆☆☆

3.1.3 Browsing the catalogue of occupations (exploration of and search for a target occupation)

In the following picture, we can see how the user can search different occupations by typing some text into the search box. The specific picture shows the state in which

- The user had searched for the term chemistry and the application shows the occupation as results of the search.
- The user has already selected the occupation of chemistry technician from the results, so he can see on the right side of the screen the details of the occupation, including the skills required for this occupation.

The button shaped as a brief-case on the bottom side of the page allows the user to select this occupation as his target occupation.

The screenshot shows the D-RESKILL@U training catalogue interface. The left sidebar displays a grid of training programs, and the right panel shows detailed information for the 'CHEMISTRY TECHNICIAN' program.

Left Sidebar (Grid of Programs):

- CHEMISTRY TECHNICIAN** (C 20.42 - Manufacture of perfumes and toilet preparations): Essentials skills : 8, Essentials Knowledge : 1
- CHEMISTRY LABORATORY TECHNICIAN** (C 20.42 - Manufacture of perfumes and toilet preparations): Essentials skills : 6, Essentials Knowledge : 4
- CHEMICAL ANALYSIS TECHNICIAN** (C 20.42 - Manufacture of perfumes and toilet preparations): Essentials skills : 13, Essentials Knowledge : 5
- CHEMISTRY LABORATORY ASSISTANT** (C 20.42 - Manufacture of perfumes and toilet preparations): Essentials skills : 7, Essentials Knowledge : 1
- NUCLEAR CHEMISTRY TECHNICIAN** (C 27.12 - Manufacture of electricity distribution (...)): Essentials skills : 9, Essentials Knowledge : 4
- MANUFACTURING CHEMISTRY TECHNICIAN** (C 20.5 - Manufacture of other chemical products): Essentials skills : 8, Essentials Knowledge : 1

Right Panel (CHEMISTRY TECHNICIAN Details):

CHEMISTRY TECHNICIAN
C 20.42 - Manufacture of perfumes and toilet preparations

Sector 1, Sector 2, Sector 3

ESSENTIALS INFORMATIONS

Company type Deeptech Startup	Company size XL	Technical domain Perfume and cosmetics
Size of team managed Large (>15)	Geographical scattering Global	

DESCRIPTION

Chemistry technicians monitor chemical processes and conduct tests to analyse chemical substances for manufacturing or scientific purposes. They work in laboratories or production facilities where they assist chemists in their work. Chemistry technicians perform laboratory activities, test chemical substances, analyse data and report about their work.

ESSENTIALS SKILLS (required for the occupation)

Analyse chemical substances

3.1.4 Browsing the training catalogue

In the subsequent image, you can observe how users can search for various training programs by entering text into the search box. The user has searched for one or more terms (such as “cosmetic”), and the application displays the corresponding training programs on the left side of the screen.

The user has selected the “Advanced Courses in Cosmetic Ingredients” training program from the search results, enabling him to view the details of that training program on the right side of the screen. This includes the skills imparted by this training program upon successful completion.

Upon landing on the “Catalogue of Trainings” page, even before initiating a search, the users will see a list of training programs derived from their skills gap. In other words, it includes all the training programs that provide the skills they need to achieve their selected target job.

The screenshot displays the D-RESKILL@U training catalog. The top navigation bar includes the logo, 'Phathways', 'Catalog', and a user profile icon labeled 'BS'. Below the navigation, there are tabs for 'Occupations' and 'Trainings', a search bar, and filter options for 'Favorites', 'Knowledge', 'Skills', and 'Duration'. A grid of course cards is shown on the left, with the first card highlighted in green. The right side of the screen features a detailed view for the 'ADVANCED COURSE IN COSMETIC INGREDIENTS' course.

ADVANCED COURSE IN COSMETIC INGREDIENTS

ESSENTIAL INFORMATION

Learning provider
University of Milan/ Department of Pharmaceutical Sciences

Country	Language	Duration	Delivery mode
Italy	Italian	36h	Hybrid

Prerequisites
Bachelor/ master degree

Inherent Requirements
Laptop

[SEE MORE](#)

DESCRIPTION

In order to make a cosmetic product, it is necessary to provide detailed knowledge that must stand behind the two advanced courses that have been activated to date (Cosmetic Science and Cosmetic Products: from Formulation to Consumer). The course in COSMETIC INGREDIENTS aims to provide in-depth expertise on the different types of ingredients that constitute a cosmetic product, referring on the one hand to their chemical characteristics and on the other to their functional profile. This is done in order to enable enrollees to obtain an overview that is indispensable for them to be able to operate competently in diverse work environments, including pharmacy, placing them in a position to interpret with ad hoc training the label of any

In the subsequent images, we can observe the comprehensive details of a training program. These details become visible as the user scrolls down the right side of the screen, as shown in the preceding picture.

ADVANCED COURSE IN COSMETIC INGREDIENTS



ESSENTIALS INFORMATIONS

Learning provider

University of Milan/ Department of Pharmaceutical Sciences

Country	Language	Duration	Delivery mode
Italy	Italian	36h	Hybrid

Prerequisites

Bachelor/ master degree

Inherent Requirements

Laptop

Assessment

Test based on questions with free answer

Certification

Certificate of participation

ECTS

6

EQF

7

Price and Financial Assistance

450.00€

- 0** Number of hours of in-person face-to-face contact with teaching staff.
- 36** Number of hours of synchronous online contact with teaching staff.
- 0** Estimated number of hours of asynchronous online content and reading/viewing of audiovisual material, etc.
- 10** Estimated number of hours spent on assessment.

[SEE MORE](#)

DESCRIPTION

In order to make a cosmetic product, it is necessary to provide detailed knowledge that must stand behind the two advanced courses that have been activated to date (Cosmetic Science and Cosmetic Products: from Formulation to Consumer).

The course in COSMETIC INGREDIENTS aims to provide in-depth expertise on the different types of ingredients that constitute a cosmetic product, referring on the one hand to their chemical characteristics and on the other to their functional profile. This is done in order to enable enrollees to obtain an overview that is indispensable for them to be able to operate competently in diverse work environments, including pharmacy, placing them in a position to interpret with ad hoc training the label of any cosmetic product.

Center part

PREREQUISITES SKILLS AND KNOWLEDGE

Calculate chemical concentration



Handle chemicals



SKILLS (provided by the training)

Manufacture cosmetics



Formulate cosmetic products



Recommend cosmetics to customers



Conform to cosmetic regulatory requirements



Advise customers on usage of cosmetics



Troubleshoot cosmetics formula issues



Analyses of cosmetic ingredients



Microbiological analyses of cosmetics



Analyses of cosmetic products



Quality control of cosmetics






Lower part:

KNOWLEDGES (provided by the training)

Analyze cosmetic raw materials	★ ★ ★ ★
Cosmetic industry	★ ★ ★ ★
Perfume and cosmetic product	★ ★ ★ ★
Allergic cosmetic reactions	★ ★ ★ ★
Cosmetics	★ ★ ★ ★
Cosmetic skin treatment	★ ★ ★ ★
Marketing of cosmetics	★ ★ ★ ★

ESCO (related occupations)

COSMETIC CHEMIST

C 20.42 - Manufacture of perfumes and toilet preparations

Essentials skills : 6

Essentials Knowledge : 4

[See more](#)



The user will have the capability to navigate between training and occupations that are more closely related to the skill provided by that training. Additionally, the user can designate a specific training as one of his favourites. In more advanced solutions or extensions of the system, users will also have the option to actively enrol in the training and commence it directly. However, it is important to note that the availability

of these features depends on the institution that offers the training and its technical capacity to integrate APIs or LLMs tools. These integrations would be part of specific and customized projects.

3.1.5 User's Profile viewing

At any given moment, users will have the ability to view their profile while navigating by simply clicking on the icon located at the top-right corner of the screen. This profile encompasses information gathered during the onboarding process, self-assessment, and any customizations made by the user throughout his/her navigation. As depicted in the following illustration, the profile can be categorized into three distinct sections: "My Account," "Skill Profile," and "Pathways."

Given the widespread requirement for GDPR compliance, our primary focus lies in developing functional features tailored to this specific domain. It is important to emphasize that the application will be fully compliant with GDPR regulations. Notably, the profile will feature two prominent buttons:

1. One button will enable users to access all the information that the application stores about them.
2. Another button will empower users to permanently delete their account.

The screenshot shows the 'MY ACCOUNT' page with the following details:

- PERSONAL INFORMATIONS:**
 - First name: Sebastian
 - Last name: Trial
 - Sexe: Male
 - Date of birth: 01/01/1975
 - E-mail adress: s.trial@gmail.com
 - Country of residence: Paris
- EDUCATION & OCCUPATION:**
 - Current level of education: Bachelor

My account: this part contains the personal information, the answer to the onboarding questions.

Skills-part: this section contains all the skills and knowledge (along with the related proficiency level) that the user has entered into the system in various ways:

- Through the completion of the self-evaluation form related to the skills of the target occupation (and other relevant parts of his/her career, like the current occupation or the last occupations).
- Through a search box where the user can search for a specific skill or knowledge, add it to his/her profile, and then assign it a proficiency level.

The skill profile reflects changes throughout the learner's life. Therefore, when the learner acquires new skills, the skill profile should be updated.

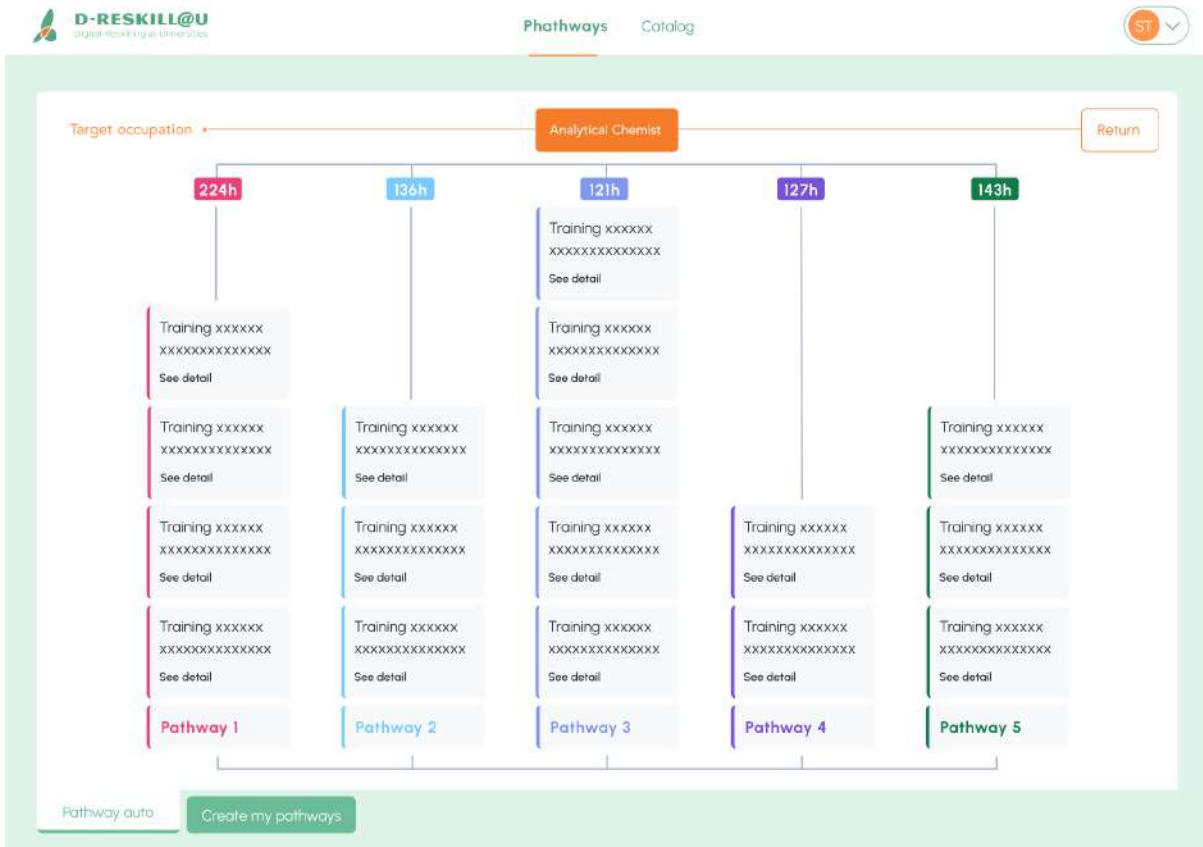
The screenshot displays the 'Skill Profile' section of the D-RESKILL@U platform. The interface includes a navigation sidebar with 'Personal Informations', 'Skill Profile', and 'Favorites'. The main content area is titled 'ESSENTIALS SKILLS (required for the occupation)' and lists eight skills, each with a star rating and a pencil icon for editing. Below this is 'ESSENTIALS KNOWLEDGES (required for the occupation)' with one knowledge item, 'Basic chemicals', also with a star rating.

Skill/Knowledge	Proficiency Level	Action
Analyse chemical substances	★★★★	Edit
Apply safety procedures in laboratory	★★★★	
Handle chemicals	★★★★	
Use chemical analysis equipment	★★★★	
Write work-related reports	★★★★	
Mentor individuals	★★★★	
Promote inclusion in research	★★★★	
Perform project management	★★★★	
ESSENTIALS KNOWLEDGES (required for the occupation)		
Basic chemicals	★★★★	

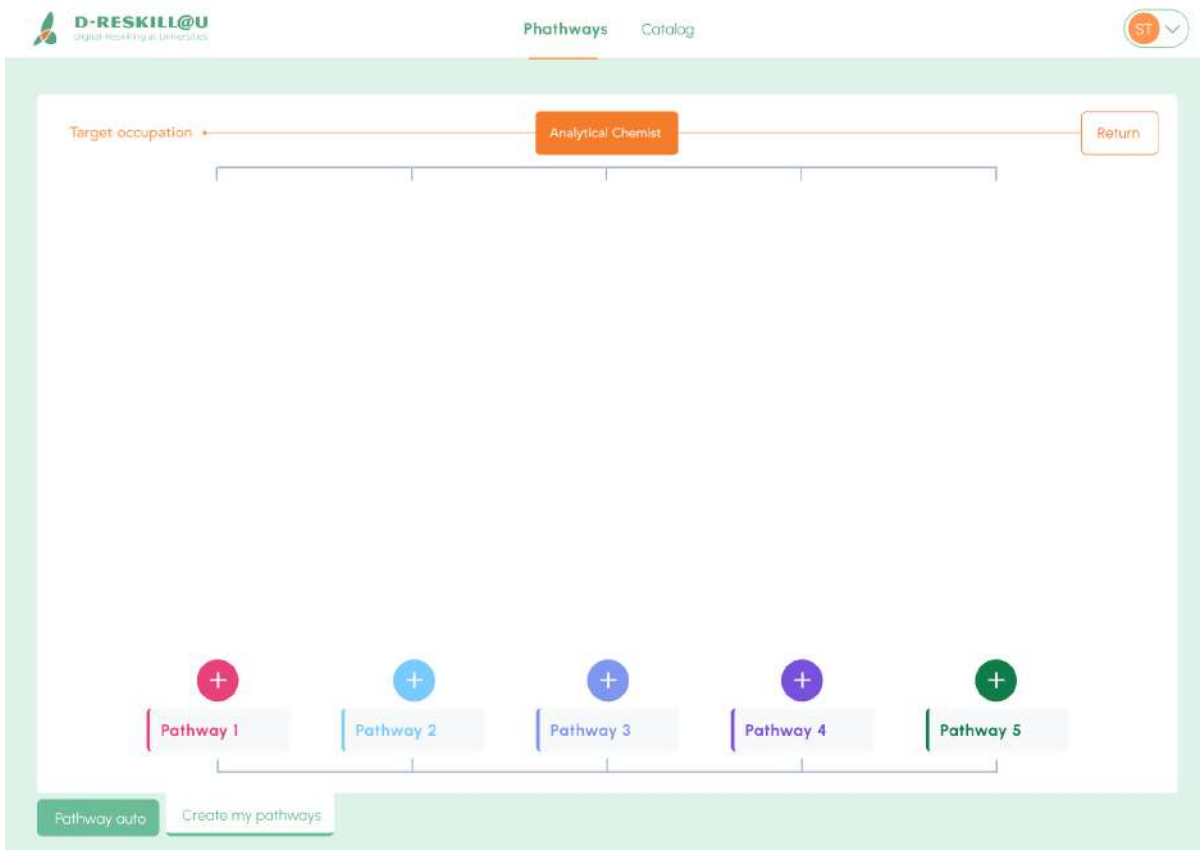
Pathways: this part of the system assists learners in constructing their own training pathways to bridge their skill gaps. Pathways are designed based on the required and provided skills, utilizing the prerequisites of each training program, which are expressed in terms of skills, knowledge, and proficiency levels.

The image below illustrates a scenario where the system automatically identifies potential training pathways to equip a learner with the skills and knowledge necessary for an “Analytical Chemist” role.

In particular, in the upper part of each pathway, you can see the cumulative information regarding the duration of the full pathway. This part of the graphic can display any information that can be aggregated from all the individual trainings that constitute a pathway. A notable example can be the ECTS credits provided by a pathway.



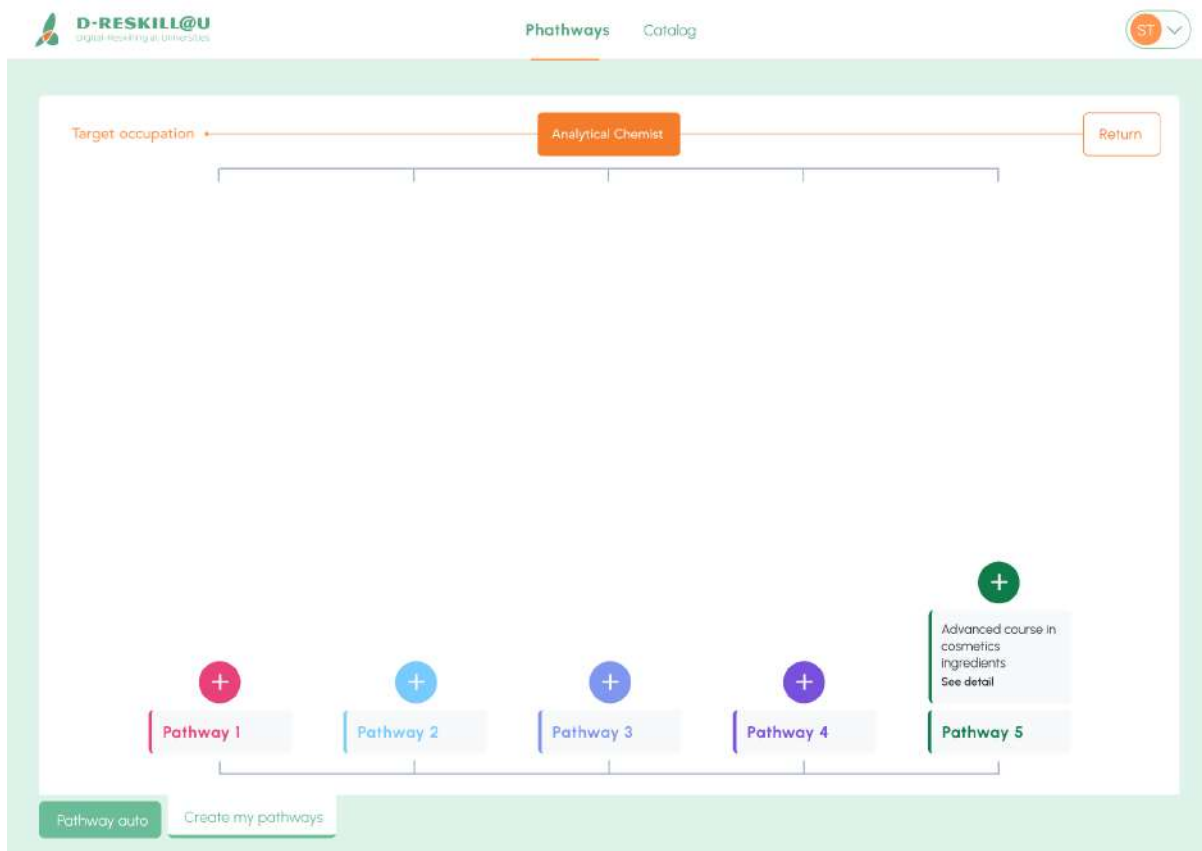
The subsequent images depict a scenario in which the user interactively constructs his/her pathways by choosing each training step-by-step for each pathway. The first image presents a list of potential starting points for the pathway.



Upon selecting a starting training, the system presents a curated list of subsequent trainings that enables the learner to progress on his/her pathway. The learner has the ability to explore the details of each training (via the “See More” button) and then make a selection.

The screenshot displays a list of training options on a green background. The first row contains four items: 'ADVANCED COURSE IN COSMETIC SCIENCE', 'TRAINING XXXXXXXXXXXX XXXXXXXXXXXX', 'TRAINING XXXXXXXXXXXX XXXXXXXXXXXX', and 'TRAINING XXXXXXXXXXXX XXXXXXXXXXXX'. Each item includes the text 'University of Milan/ Department of pharmaceutical sciences', a 'SEE MORE >' button, and a 'Select this training' button. The second row contains one item: 'COSMETIC PRODUCTS: FROM FORMULATION TO CONSUMER', which also includes 'University of Milan/ Department of pharmaceutical sciences', a 'SEE MORE >' button, and a 'Select this training' button.

The system records the learner's selection and constructs a step in the pathway. The learner has the option to click on a training program in his/her pathway and modify the pathway as needed.



3.2 Teacher

3.2.1 Adding a training

The following picture illustrates that the teacher can “add a new training” or a “new micro-credential” by clicking a button (see top-right section).

MY TRAININGS (3)

[Add a new training](#)
[Add a micro credential](#)

COVERING SKILLS OF A JOB OCCUPATION >

DRAFT

Training	Cosmetic products: from formulation to consumer	⋮
Micro credential	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed non risus. Suspendisse lectus tortor, dignissim sit amet, adipiscing ...	⋮
Micro credential	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed non risus. Suspendisse lectus tortor, dignissim sit amet, adipiscing ...	⋮

[See more](#)

PUBLISHED

Training	Lorem ipsum dolor sit amet, consectetur	⋮
Micro credential	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed non risus. Suspendisse lectus tortor, dignissim sit amet, adipiscing ...	⋮
Micro credential	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed non risus. Suspendisse lectus tortor, dignissim sit amet, adipiscing ...	⋮

Then, in the next picture, the user is able to see the possible action on *specific existing trainings and microcredential-compliant trainings*.

MY TRAININGS (3)

[Add a new training](#)
[Add a micro credential](#)

COVERING SKILLS OF A JOB OCCUPATION >

DRAFT

Training	Cosmetic products: from formulation to consumer	⋮
Micro credential	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed non risus. Suspendisse lectus tortor, dignissim sit amet, adipiscing ...	⋮
Micro credential	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed non risus. Suspendisse lectus tortor, dignissim sit amet, adipiscing ...	⋮

[See more](#)

PUBLISHED

Training	Lorem ipsum dolor sit amet, consectetur	⋮
Micro credential	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed non risus. Suspendisse lectus tortor, dignissim sit amet, adipiscing ...	⋮
Micro credential	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed non risus. Suspendisse lectus tortor, dignissim sit amet, adipiscing ...	⋮


For each existing training, the teacher has the option to modify or delete it. In the case of a published training, the teacher has also the ability to create one or more micro-credential trainings derived from it, as demonstrated in the subsequent screens.

The screenshot displays the 'MY TRAININGS (3)' section of the D-RESKILL@U dashboard. At the top, there is a search bar labeled 'Research by name, knowledge, skills...' and two buttons: 'Add a new training' and 'Add a new credential'. Below the search bar are two dropdown menus for 'Knowledge provided' and 'Skills provided', and a link 'COVERING SKILLS OF A JOB OCCUPATION >'. The training items are categorized into 'DRAFT' and 'PUBLISHED'. The 'DRAFT' section contains three items: 'Cosmetic products: from formulation to consumer', and two placeholder items with 'More details' buttons. The 'PUBLISHED' section contains one item: 'Cosmetic ingredients', and two placeholder items. A context menu is open over the 'Cosmetic ingredients' item, showing options: 'Edit', 'Delete', and 'Convert into a micro credential'. A 'See more' link is visible at the bottom right of the draft section.

3.2.2 Assessing skills alignment between occupations and training offers

This feature enables teachers to assess whether a particular training program encompasses all the necessary skills and knowledge for a specific job.

The subsequent screen depicts a scenario where the teacher (or program manager) selects “Analytical Chemist” as the target occupation.


COVERING OF SKILLS
 Enter the occupation for what you would like to see all the courses provided by your university that can cover essential skill-set required to perform it!

[Confirm](#)

The system pinpoints training programs (either traditional or already structured as micro-credentials) that are capable of delivering the necessary skills for a specific occupation. An example is depicted in the following image, where the system identifies three pertinent training programs.

ANALYTICAL CHEMIST

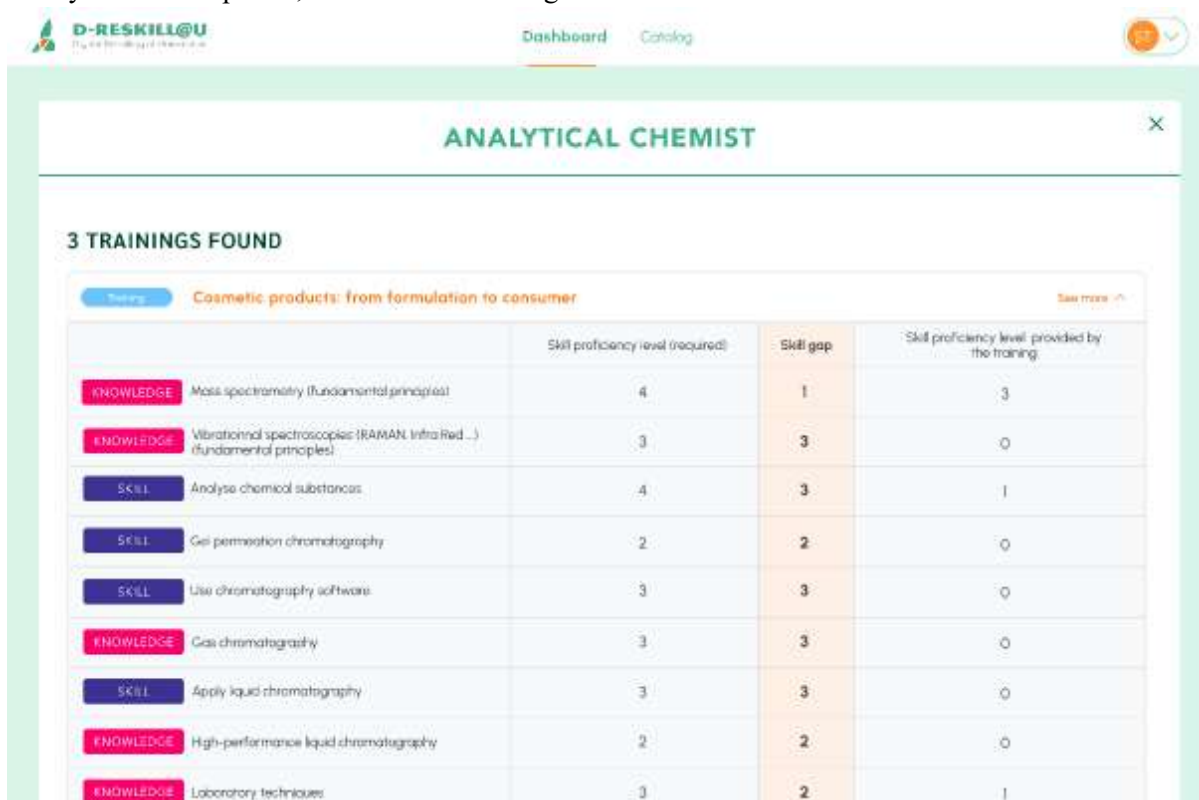
3 TRAININGS FOUND

Training	Cosmetic products: from formulation to consumer	See more ✓
Micro-credential	La spectrométrie de masse comme outil analytique Lev1	See more ✓
Micro-credential	La spectrométrie de masse comme outil analytique Lev2	See more ✓

[Create a new training](#) [Create a micro credential](#)

[COVERING ANOTHER JOB OCCUPATION](#) >

The teacher can select each training program and examine how it contributes to the skills and knowledge necessary for an occupation, as shown in the image below.



The screenshot shows a dashboard for 'ANALYTICAL CHEMIST' with 3 trainings found. The training selected is 'Cosmetic products: from formulation to consumer'. The table below shows the proficiency levels for various skills and knowledge areas.

		Skill proficiency level (required)	Skill gap	Skill proficiency level provided by the training
KNOWLEDGE	Mass spectrometry (fundamental principles)	4	1	3
KNOWLEDGE	Vibrational spectroscopies (RAMAN, InfraRed ...) (fundamental principles)	3	3	0
SKILL	Analyse chemical substances	4	3	1
SKILL	Gel permeation chromatography	2	2	0
SKILL	Use chromatography software	3	3	0
KNOWLEDGE	Gas chromatography	3	3	0
SKILL	Apply liquid chromatography	3	3	0
KNOWLEDGE	High-performance liquid chromatography	2	2	0
KNOWLEDGE	Laboratory techniques	3	2	1

In each row of the first column, we see the names of the skills and knowledge required for the “Analytical Chemist” occupation. The second column displays the proficiency levels of these skills and knowledge necessary to perform the selected occupation. The fourth column shows the proficiency levels that a specific training program can provide to a learner who successfully completes it. In between (third column) the skill gap that is simply the algebraic difference between column 2 and 4

3.3 Industry Expert

The Industry Expert role is tasked with ensuring the quality of data related to occupations and skills, from a labour market perspective.¹ Specifically, the industry expert will determine the proficiency levels of the skills and knowledge required for occupations within his specific industry. Multiple accredited individuals can assume this role, and the system can also accommodate variations, such as calculating the average of the values set by industry experts for a specific field.

¹Concerning the software system, industry experts only require an account to access the system. The decision regarding which experts to include is determined by the educational/training policy of the organization (such as a university or school) responsible for commissioning the software implementation. This policy may encompass a select group of experts or a more extensive one, drawing inspiration from the approach ESCO employs when assembling expert groups for various subjects.

The industry expert can also enhance the data in other ways, such as:

- Modifying an existing occupation by editing some of its fields
- Adding an existing skill to an occupation
- Introducing a new skill to an occupation
- Establishing an intra-occupation ranking of skills based on their importance for the job
- Creating a new occupation
- Declaring a skill or knowledge as mandatory or optional for an occupation


The following screen displays the main page for the industry expert. From this page, they can select an existing occupation from the search box or create a new one using the button at the top right.

The screenshot shows the 'MY OCCUPATIONS (3)' page. At the top, there is a search bar with the placeholder text 'Research by name, knowledge, skills, ...' and a purple button labeled 'Add a new occupation'. Below the search bar are two dropdown menus: 'Knowledge provided' and 'Skills provided'. The page is divided into two sections: 'DRAFT' and 'PUBLISHED'. The 'DRAFT' section contains three rows of occupation data. The first row is 'Chemistry technician'. The second and third rows contain placeholder text: 'Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed non risus. Suspendisse lectus tortor, dignissim sit amet, adipiscing ...'. Each row has a three-dot menu icon on the right. A 'See more' link is located at the bottom right of the 'DRAFT' section. The 'PUBLISHED' section also contains three rows of occupation data. The first row is 'Analytical chemist'. The second and third rows contain placeholder text: 'Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed non risus. Suspendisse lectus tortor, dignissim sit amet, adipiscing ...'. Each row has a three-dot menu icon on the right.


By default, any edits made to an occupation are in draft form, meaning they are not visible to other system users, particularly learners. When the industry expert has finished editing and wishes to publish it, he must explicitly click the “Publish” button. This button can be found by clicking on the icon with three vertical dots located on the right side of the occupation they wish to publish, as shown in the following screen.

The screenshot shows the 'MY OCCUPATIONS (3)' section of the D-RESKILL@U dashboard. At the top left is the logo 'D-RESKILL@U digital reskilling at Universities'. The navigation bar includes 'Dashboard' and 'Catalog', and a user profile icon 'ST' is in the top right. The main content area has a search bar with the placeholder 'Research by name, knowledge, skills, ...' and a purple button 'Add a new occupation'. Below the search bar are two dropdown menus: 'Knowledge provided' and 'Skills provided'. The 'DRAFT' section contains a table with three rows. The first row is 'Chemistry technician'. The second and third rows contain placeholder text. A context menu is open over the second row, showing 'Edited', 'Published', and 'Deleted' options. A 'See more' link is at the bottom right of the draft section. The 'PUBLISHED' section contains a table with three rows. The first row is 'Analytical chemist'. The second and third rows contain placeholder text.

Once an occupation has been updated, it is accessible by the learner in the catalogue of occupations.


D-RESKILL@U
Digital Reskilling at Universities

[Dashboard](#) [Catalog](#)



Occupations
Trainings

Favorites
Knowledge required
Skills required
Sectors

ANALYTICAL CHEMIST

C 20.42 - Manufacture of perfumes and toilet preparations

Essentials skills : 8
 Essentials Knowledge : 1

[See more](#)

CHEMISTRY LABORATORY TECHNICIAN

C 20.42 - Manufacture of perfumes and toilet preparations

Essentials skills : 6
 Essentials Knowledge : 4

[See more](#)

CHEMICAL ANALYSIS TECHNICIAN

C 20.42 - Manufacture of perfumes and toilet preparations

Essentials skills : 13
 Essentials Knowledge : 5

[See more](#)

CHEMISTRY LABORATORY ASSISTANT

C 20.42 - Manufacture of perfumes and toilet preparations

Essentials skills : 7
 Essentials Knowledge : 1

[See more](#)

NUCLEAR CHEMISTRY TECHNICIAN

C 27.12 - Manufacture of electricity distribution (...)

Essentials skills : 9
 Essentials Knowledge : 4

[See more](#)

MANUFACTURING CHEMISTRY TECHNICIAN

C 20.5 - Manufacture of other chemical products

Essentials skills : 8
 Essentials Knowledge : 1

[See more](#)

ANALYTICAL CHEMIST

✕

C 20.42 - Manufacture of perfumes and toilet preparations

Sector 1

Sector 2

Sector 3

ESSENTIAL INFORMATION

Company type	Company size	Technical domain
Deeptech Startup	XL	Perfume and cosmetics
Size of team managed	Geographical scattering	
Large (>15)	Global	

DESCRIPTION

Chemistry technicians monitor chemical processes and conduct tests to analyse chemical substances for manufacturing or scientific purposes. They work in laboratories or production facilities where they assist chemists in their work. Chemistry technicians perform laboratory activities, test chemical substances, analyse data and report about their work.

ESSENTIALS SKILLS (required for the occupation)

Analyse chemical substances

★ ★ ★ ★ ★

Edit

4. Proposed technical solutions to the incompleteness of the ESCO database

Due to the issues discovered in the current version of ESCO and the length of its update cycle, the consortium has agreed that the software system under design should address the needs that have arisen from discussions. Therefore, it should not be confined to the current or future versions of ESCO.

The system's design will always prioritize EU guidelines, which serve as a guide for conceptualization and design. However, it may also include standard and custom extensions to the ESCO database.

To maintain compatibility with ESCO, the system will require a dedicated technical subsystem, or at least a set of rules, to manage any potential discrepancies with ESCO.

Standard updates from ESCO:

The system will verify and update the values of primary ESCO entities, such as Occupations, Skills, and Knowledge, following each new release from standard ESCO.

Should there be changes to the structure of the ESCO database, an analysis will be necessary. The ESCO programmatic documents anticipate the long-term design of the system, so certain evolutions, like the introduction of the "Competence" high-level concept or the proficiency levels required for a job's skills and knowledge, could already be considered to some extent.

Standard ESCO extension:

If a teacher or industry expert wishes to add or modify an instance of a primary entity (Occupation, Skills, Knowledge), the system will submit a change proposal to the ESCO committee in the usual manner (currently, a properly formatted spreadsheet sent by mail). The system should assist the user in applying for an extension only when absolutely necessary, by displaying possible current choices already available. The ESCO committee will then have the option to accept, reject, or discuss the request.

With ESCO's approval, we could establish an actual role (ESCO Expert) within the system, complete with its panel. An ESCO expert could directly accept, reject, and initiate a discussion thread about a specific proposal.

Conflict detection and resolution

The system should identify potential name clashes and similar discrepancies with the standard ESCO database and assist the user in resolving these issues.

ANNEX

A1	A	B	C	D	E	F
1		As a ...<ACTOR/ROLE>	I want to ...<GOAL>	so that I get <BENEFIT> (as specific as possible)		Name of the feature
2						
3	"Smart Catalogue"					
4		As a learner, in Upskilling	find a training ...			
5		As a learner, in Upskilling	... (self-evaluate my skills			
6		As a learner, in Upskilling	... find the trainings that allow me to obtain a skill			Search training by skills
7		As a learner, in Upskilling	... find the training that allow me to obtain my missing skills			Search training by skills (implicitly) filtered by missing skills
8		As a learner, in Upskilling	... find the trainings that allow me to obtain a knowledge			Search training by knowledge
9		As a learner, in Upskilling	... find the training that allow me to obtain my missing knowledge			Search training by knowledge (implicitly) filtered by my missing knowledge
10						
11						
12		As a learner, in Reskilling	find a formation ...			
13		As a learner, in Reskilling	... (self-evaluate my skills			
14		As a learner, in Reskilling	... find the trainings that allow me to obtain a skill			Search training by skills
15		As a learner, in Reskilling	... find the training that allow me to obtain my missing skills			Search training by skills, (implicitly) filtered by missing skills
16		As a learner, in Upskilling	... find the trainings that allow me to obtain a knowledge			Search training by skills
17		As a learner, in Upskilling	... find the training that allow me to obtain my missing knowledge			Search training by knowledge (implicitly) filtered by missing skills
18						
19						
20		As a learner	... find the trainings that allow me to obtain a skill, sorted by field/sector			
21		As a learner	... find the trainings that allow me to obtain a skill, sorted by formal duration			
22		As a learner	... find the trainings that allow me to obtain a skill, sorted by average duration			
23						
24		As a learner	... find the trainings that allow me to obtain a specific job (occupation) (*)			Search training by job
25						
26						
27			add a training (LLL) (helpful for passing from initial to LLL, e.g. to decompose/identify skills, see to be put in 1 or more LLL)		core	
28		As a teacher	add a training "initial"		core	
29		As a teacher	add a micro-credential		core	
30				a sharable and ESCO-compliant description should have at the end of the training	core	
31		As a teacher	attach a skill to a existent training	a sharable and ESCO-compliant description should have at the end of the training	core	
32		As a teacher	attach a knowledge to a existent training		core	
33		As a teacher	add self-assessment survey for evaluate a specific competence ?		core	
34			release an on-standard nation wide certificate e.g. "certificat de réussite" (france competence)		to be better specified	
35		As a teacher	attach a micro-credential (proposed) to a training		core	
36		As a teacher	attach a micro-credential to a training		core	
37						
38						
39						
40		As a teacher	to see how different trainings covers a set of skills, in particular the set of skills required for a specific occupation		advanced	
41		As a teacher	to be helped/supported in creating/structuring a microcredential course, from an existent course		advanced	
42						
43						
44						
45						
46		As a occupations expert (aka industry expert)	attach a proficiency level to a skills required for a specific occupation	so I improve the quality or completeness of the data source		(ESCO) database update
47		As a occupations expert (aka industry expert)	attach a proficiency level to a knowledge required for a specific occupation	so I improve the quality or completeness of the data source		(ESCO) database update
48		As a occupations expert (aka industry expert)	attach a skill to a existent occupation	so I improve the quality or completeness of the data source		(ESCO) database update
49		As a occupations expert (aka industry expert)	attach a knowledge to a existent occupation	so I improve the quality or completeness of the data source		(ESCO) database update
50		As a occupations expert (aka industry expert)	declare (set the value) optional a skill for a specific occupation	so I improve the quality or completeness of the data source		(ESCO) database update
51		As a occupations expert (aka industry expert)	declare (set the value) essential a skill for a specific occupation	so I improve the quality or completeness of the data source		(ESCO) database update
52		As a occupations expert (aka industry expert)	Add a new occupation	so I improve the quality or completeness of the data source		(ESCO) database update
53						
54						