

PROGRAMME ERASMUS+ / PARTENARIATS STRATEGIQUES

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Intellectual Output 2 (IO2)

Progress Report

Design and Implementation of the Platform

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Document Description

This document presents the work done in relation to IO2 Platform.

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List of Abbreviations

Terms / Abbreviations Definitions

IO	Intellectual Output
R&D	Research and Development
LMS	Learning Management System
VET	Vocational Education and Training
KPIs	Key Performance Indicators
EIT	Education Institutes/Teachers
ET	Enterprises/Trainers
ERD	Enterprises/R&D
TC	Transversal Competences
IR	Internal Repository
EDENCP	ED-EN Collaboration Platform
DB	Data Base

Document History

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Abstract

The European Union (EU) is focusing on disseminating information primarily through EU institutions and European networks specialized in education and lifelong learning. Their outreach efforts also extend to European organizations representing social partners and educational institutions. The aim was to expand the reach and influence of the ED-EN Hub network beyond its initial regions after completing Intellectual Output 2 (IO2), a phase dedicated to the design and development of a digital platform. Over time, this platform will play a crucial role in fostering collaboration, ensuring relevance through regular updates, and enhancing the collaborative benchmarking initiative on the project's platform. This report introduces the European platform, which will be proposed to other EU regions to amplify the Ed-En Hub's impact.

IO2 was centred on creating a digital platform for use within the ED-EN Hub ecosystem and subsequently offering it to other EU regions as a means of multiplying the project's impact. This task involves harnessing new, rapidly evolving digital technologies, including services and user interfaces, to streamline the hub's operations and deliver value to the community. The platform's core function is to facilitate collaboration, interactions, and transactions among its stakeholders by nurturing a networked learning community.

In practical terms, the output of IO2 comprise a collaboration platform and a supporting technology platform. These platforms will make the participatory development model for collaboration infrastructures, represented by the ED-EN Hub, available to regions outside the project partnership. This expansion is expected to significantly increase the project's impact. Furthermore, the developed platform will undergo continuous validation and testing to ensure its effectiveness.

The ED-EN Hub's primary focus is on education and lifelong learning. At the EU level, the platform supports disseminating information through key channels, such as EU institutions and specialised European networks. Additionally, they engage with European organisations that advocate for social partners and educational institutions. This approach underscores the commitment to sharing knowledge and expertise with a broad range of stakeholders.

The expansion of the ED-EN Hub's reach and influence is a pivotal goal. Achieving this goal was made possible through IO2, which concentrates on the creation of a digital platform tailored to the Hub's needs. This platform will not only streamline operations but also leverage cutting-edge digital technologies to enhance user experiences and add value to the community it serves. By fostering a networked learning community, the platform enables collaboration, interaction, and transaction among stakeholders.

One of the key outcomes of IO2 is the development of two critical components: a collaboration platform and a supporting technology platform. These platforms will

serve as the backbone of the ED-EN Hub ecosystem, making it easier for regions beyond the initial project partnership to adopt and benefit from the collaborative infrastructure model. This expansion is significant as it has the potential to multiply the impact of the project across the EU.

To ensure the effectiveness of these platforms, rigorous validation and testing processes were put in place. This step was crucial to guarantee that the digital platform functions as intended and can seamlessly support the participatory development of collaboration infrastructures. Ultimately, the European platform created through IO2 will serve as a catalyst for the project's broader impact, spreading knowledge and innovation in education and lifelong learning to regions across the EU.

Introduction

The fusion of technology and collaboration is driving transformative change in education and enterprise. A digital platform is crucial in fostering Education-Enterprise collaboration, serving as a bridge between academia and industry. In today's globalized economy, with rapid changes and demands for a skilled workforce, the need for such a platform is more evident than ever.

This platform facilitates seamless communication among education institutions, enterprises, trainees, and trainers. It enables the creation of tailored educational programs and upskilling opportunities that align with evolving industry needs. It empowers these institutions and businesses to exchange knowledge, resources, and insights, ensuring curricula and skill development remain relevant. Graduates are better prepared for the dynamic job market.

Additionally, this platform promotes innovation by incubating revolutionary ideas and projects that drive economic growth. In the digital age, it plays a crucial role in nurturing a symbiotic relationship between education and enterprise, fostering a continuous cycle of learning, adaptation, and progress.

The report is divided into two main sections:

- 1) **Process for Specification of Digital Platform:** This section likely outlines the steps and methodologies used to identify the requirements and specifications for the digital platform. It may involve research, stakeholder engagement, and data analysis to ensure the platform meets the needs of both education and enterprise sectors.
- 2) **Digital Platform Specification and Demonstration:** This section is likely a detailed presentation of the specifications and features of the digital platform. It might include demonstrations or examples of how the platform works in practice, showcasing its capabilities and benefits for Education-Enterprise collaboration.

In summary, the report emphasizes the pivotal role of a technological platform in facilitating collaboration between education and enterprise. It highlights its significance in adapting to the fast-changing demands of the job market and fostering innovation, ultimately promoting a continuous cycle of learning and progress.

1. Process for Specification of Digital Platform

1.2 ED-EN HUB Digital Platform

The University of Northern Lights (UNL) is undertaking a significant initiative by creating the IO2, a digital platform intended for integration within the EDENHUB ecosystem. This platform, designed to harness cutting-edge and rapidly evolving digital technologies, will enhance, and streamline the operational processes of the Hub, ultimately benefiting the community it serves.

The primary objective was to build a platform that leverages innovative services and user interfaces to optimise hub operations while generating value for stakeholders. One of its key roles is fostering collaboration, interactions, and transactions among the various parties involved. Essentially, it aimed to create a networked learning community that facilitates seamless engagement among stakeholders.

Practically, this initiative yielded a collaboration platform along with supporting technology infrastructure. These tools enable the participatory development model for collaboration infrastructures, known as the ED-EN Hubs, to be shared with regions outside the initial project partnership within the European Union. This dissemination of knowledge extends the impact of the project to a wider audience.

The development of this platform underwent a rigorous validation and testing process to ensure its effectiveness and functionality in real-world scenarios. Ultimately, UNL's efforts in creating this digital platform aimed to improve the way ED-EN Hub operates and offer a replicable model for other regions, maximising the project's influence and benefits.

1.2.1 Platform Potential Users:

- Enterprises
 1. Trainers
 2. Trainees -> may be the same as (5) Learners
 3. Human Resources
 4. R&D Responsible
- Education Institutes
 5. Learners
 6. Teachers/ curricula designers
- Public Administration
 7. Policy Makers / Regional Authorities

- Continuing VET Funding

Other stakeholders may need to collaborate through the platform, but not with specific functions.

1.2 ED-EN Hub Guiding Principles

Table 1 summarises the guiding principles of ED-EN Hub, which ensures the hub's long-term cultural survival throughout its life. This table reflects a matrix that contains a) the aforementioned ED-EN Hub processes (listed on the top row) required for collaboration in the ED-EN Hub, and b) the IO2 system functions (listed in the column on the right). The contribution of the IO2 system functions in each respective process of ED-EN Hub is marked by X.

Table 1. IO2 system functions and contributions in each process of ED-EN Hub

IO2 System Functions	EDENHUB Main Processes				
	Intellectual Outputs (IOs)/Objectives				
	IO1	IO1+IO3	IO1+IO3	IO4	IO2 (framework)+IO5
	Identify Skills Requirements	Co-Design, Develop and Training	Detect, Assess and Certify	Career Guidance	Organisational Benchmarking
MaTransversal Competences Engine (Search engines)	x	x	x	x	
Collaboration	x	x	x	x	x
Managing training		x			
Training Execution Support		LMS			
Design Curriculum	x	x			
Insertion of new TRANSVERSAL COMPETENCES demands	x	x		x	
Tools to evaluate Performance (benchmarking)			x	x	x
Database/service offering different tools	x	x	x	x	x

Each system function addressed in Table 1 is briefly explained as follows:

- **Matching Engine (search engines)** – refers to a software system that is designed to carry out web searches (Internet searches) in a systematic way for particular information specified in a textual web search query. The search results are generally presented in a line of results, referred to as search engine results pages (SERPs). The information may be a mix of links to web pages, images, videos, infographics, articles, research papers, and other types of files [1]. The most well-known search engines are Google, Bing, Yahoo, Baidu, AOL, Ask.com, Excite, DuckDuckGo, Wolfram Alpha, and Yandex.
- **Collaboration** – refers to a working practice whereby some people, entities, or organizations work together to complete a task, solve a problem, and/or achieve shared goals [2].

- **Managing Training** – offers flexible strategies to properly manage different aspects of training from programme creation to evaluating and prioritising learning needs, creating and planning learners’ development initiatives, managing the administration of programmes and their costs, implementation and monitoring the success rates as well as measuring the results [3].
- **Training Execution Support** – provides the user-support needed, develops engaging training materials, and proposes learning strategies for performance-based training.
- **Design Curriculum** – is an ongoing, cyclical, and analytical process that helps to plan instruction. It strives to identify what will be done, who will do it, and what schedule to follow. Curriculum design focuses on learning strategies, processes, materials, and experiences towards defined learning and/or performance in relation to Transversal Competences [4].
- **Insertion of new competencies demands** – is the process of identifying and adding the key competencies and basic skills (e.g., personal characteristics, attitudes, cognitive skills of critical thinking, problem-solving, knowledge application, creativity, interpersonal skills like communication and collaboration, intrapersonal skills like self-direction, motivation, and learning how to learn) required to perform the teaching and training with success [5, 6].
- **Tools to evaluate performance (benchmarking)** – focuses on identifying the appropriate performance appraisal tools and methods that measure trainee’s performance level across key competencies.
- **Database/Service offering different tools** – refers to discovering and identifying the potential databases and services that introduce and provide promising, validated, and trusted tools. They need to be considered for application in ED-EN Hub (e.g., tools to evaluate performance).

The development of the online portal was a collaborative process over a number of meetings. The following sections outline the process.

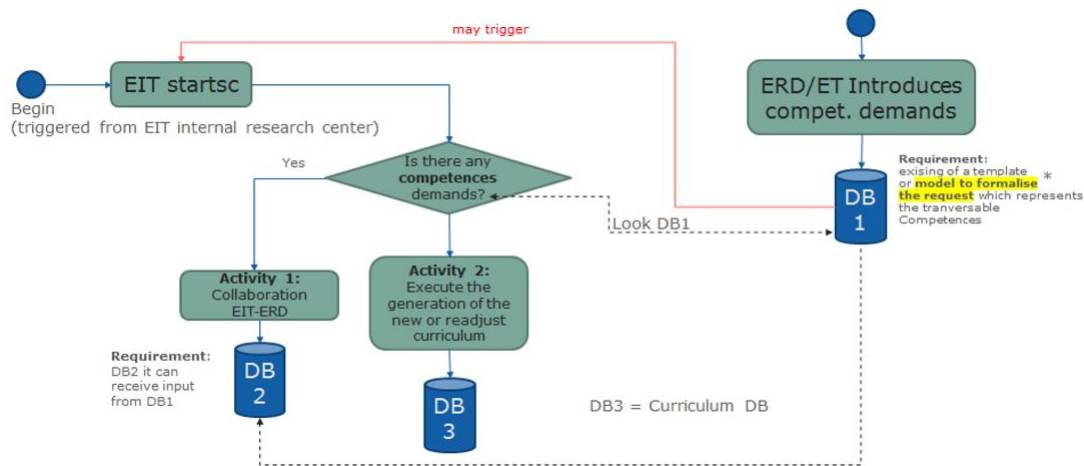
2. Scenarios and Activities

Considering the functions and processes addressed in Table 1, some scenarios, and activities for collaboration between Industry and education Institutes were developed including:

Scenario 1 (collaboration invitation) - when an Industry invites Education Institutes to collaborate with them (to for example fulfil a competence demand). Having received the invitation, the Education Institutes will accordingly and collaboratively try to respond to it. The following actors would participate in this scenario:

- Education Institutions/Teachers (EIT)
- Enterprises/Trainers (ET)
- Enterprises/R&D Responsible (ERD)

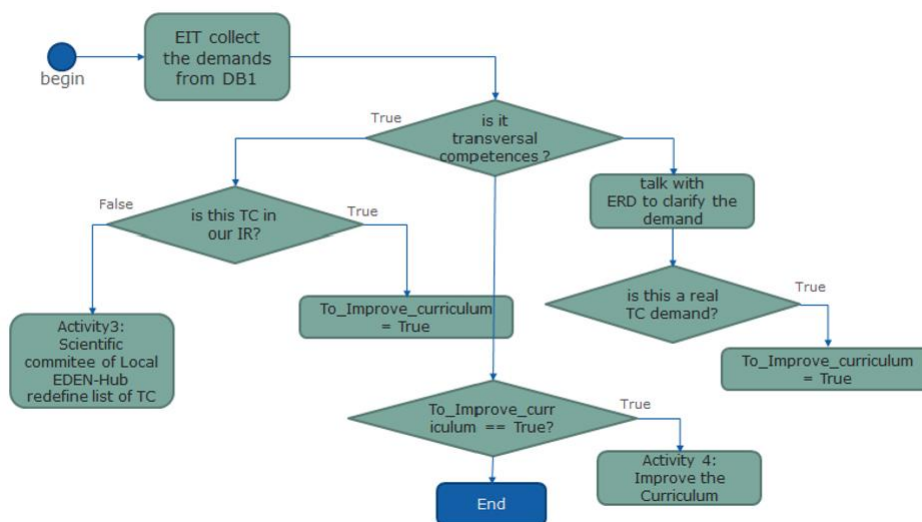
Figure 1 Scenario 1



Activity 1 (collaboration creation from scenario 1) – EIT tries to fulfil the demands of ERD (to for example design an appropriate curriculum). In this regard, EIT initially collects announced demands from Data Base 1 (DB1) and then proceed to fulfilment of demand. The process of performing activity 1 is demonstrated in Figure 2.

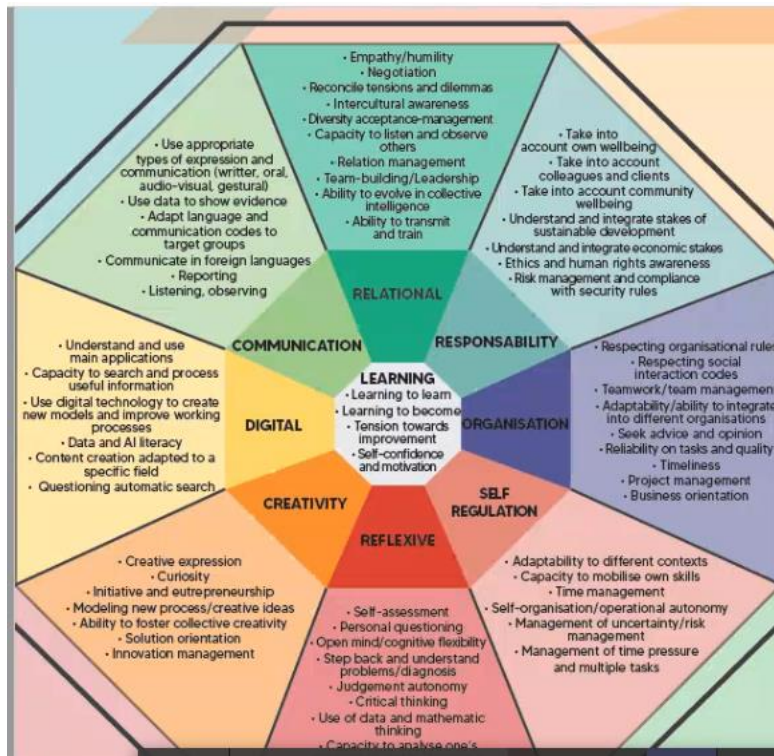
- Transversal Competences (TC)
- Internal Repository (IR)

Figure 2. Activity one



The model for Enterprises identifying demands is contained in Figure 3.

Figure 3. Model for Enterprises identify demands



3. Identifying the Main Features of Digital Platform

In IO2, the primary focus is on establishing a "system view" and developing a technology platform. The goal is to create a common understanding and a clear vision for (a) the collaboration ecosystem of ED-EN Hubs and (b) the structure and functions the platform should encompass for Hub collaborations.

The central question is whether the ED-EN Hubs ecosystem should be seen as a "Mass Collaborative Learning Hub," and the answer is a resounding "YES." These hubs bring together a diverse group of participants with various backgrounds to collaboratively learn. To understand the dimensions of collaboration, 15 successful examples of mass collaborative communities were analysed, resulting in the identification of 9 dimensions of collaboration and associated functions, activities, and features.

To determine the relevance of these dimensions and features for the ED-EN Hubs collaboration platform (EDENCP), a questionnaire was designed. Partners from ED-EN Hubs are invited to provide insights into the importance of each questionnaire item. Selected dimensions and features will undergo a feasibility assessment by technical partners in the UNL group, followed by an evaluation of their effectiveness for implementation in EDENCP. This structured approach ensures the platform aligns with the collaborative learning goals of the ED-EN Hubs ecosystem.

4. Designed Questionnaire

In the questionnaire, the nine identified dimensions for EDENCP are listed in the left column. The associated functions, activities, and features for each dimension are addressed in the form of a statement (right in front of dimensions) that their potential application for EDENCP should be gauged. In the right column, there is a checklist through which the responders can give their answer/opinion to each issue addressed in the question, and in this way, they will judge its importance for EDENCP. Possible Answers in the Checklist.

There are six possible answers for each statement in the checklist, as the following):

- Strongly Disagree (SDA)
- Disagree (DA)
- Agree (A)
- Strongly Agree (SA)
- I Don't Know (IDK)
- I Am Not Sure, now (IANS)

Note:

The name, type, and the number of considered dimensions and associated features for EDENCP could be changed, revised, or developed based on the answers and suggestions that we will receive through the questionnaire from the respondents.

Table 2 presents the 15 examples of mass collaborative communities that were analysed for identifying the main features of the digital platform.





TABLE 2. FIFTEEN EXAMPLES OF MASS COLLABORATIVE COMMUNITY AND A BRIEF DESCRIPTION

15 examples of mass collaborative community
1. Wikipedia – is a web-based, free-content encyclopaedia used as an open collaboration project developed by a very large (open) community of volunteer editors.
2. Digg – is a social networking and news aggregating website. Contributors submit their stories for consideration and promotion, and they are either voted to be digger or buried.
3. Yahoo! Answers – is a question-and-answer website driven by a community in which participants can ask and/or answer questions about anything.
4. SETI@home – is an Internet-based public volunteer computing project which intends to evaluate radio signals, searching for signs of extra-terrestrial intelligence.
5. ScraTransversal Competencesh – is a block-based visual programming language and online community which enables participants to build and share their stories, games, animations, and music on the web.
6. Galaxyzo – is a crowdsourced astronomy project that classifies the morphology of large numbers of galaxies through cooperation of interested participants.
7. Foldit – is an online puzzle video game about protein folding. It invites people to fold the structures of selected proteins (cancer) by using tools provided in the game.
8. Applications of the Delphi method – is a structured communication method that evaluates the results of multiple rounds of questionnaires sent to a panel of experts to gain group consensus.
9. Climate Colab – is an online crowdsourcing platform that invites people to address global climate changes.
10. Assignment Zero – is an experiment in crowd-sourced journalism in which participants collectively produce a piece of work.
11. DonationCoder – is a website hosting a community of programmers and software fans that collectively organize and finance software development.
12. Experts Exchange – is a trusted global online community that tries to solve the world's technology problems.

13. Waze – is a community-driven GPS and navigational app that provides navigation information, route details, and travel times.
14. Makerspaces – is a collaborative workspace where people can come together to use tools for exploring, making, sharing, learning, and /or completing a project.
15. SAP Community Network (SCN) – is the official user community of SAP SE. SAP software users, developers, consultants, mentors, and students use the SAP Community Network to get help, share ideas, learn, innovate and connect with others.

The developed questionnaire (for identifying the main features that might be integrated into the platform) is demonstrated in Table 3. At this stage, the questionnaire is sent to some partners for collecting the first round of responses and feedback.

TABLE 3. DEVELOPED QUESTIONNAIRE FOR IDENTIFYING THE KEY FEATURES THAT MIGHT BE INTEGRATED INTO THE PLATFORM

Questionnaire for Developing the ED-EN HUBs Collaboration Platform (EDENCP)					
EDENCP provides a supported training and learning hub where an unlimited number of distributed but enthusiastic trainers and learners from diverse backgrounds come together to build a long-term collaboration. The participants in the hub will attempt to establish new ways and develop more scenarios for sharing their knowledge, experiences, and ideas which can help to develop their level of education, qualifications, and competencies.					
Considered Dimensions	Main Features That Might be Integrated into Platform	Checklist			
					
Organizational (This relates to the organization of the hub or the way it is set up. It is also related to the action of organizing something)	1) It is important that the EDENCP be a user-driven service (users may be co-creators of the service) <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	2) It is important that even general users could help (the partners and administrators) to develop the EDENCP <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	3) It is important that the EDENCP engages diverse groups (e.g., public, experts, and professionals) in the process of learning <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	4) It is important that the EDENCP provides opportunities for collective learning <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
I do not know	I am not sure				
Environmental (this relates to the hub's surroundings and the impact of participants' activities on its condition)	5) It is important that the EDENCP be used for different purposes (e.g., education, tutorials, developing competencies, promoting workforces, R&D) <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	6) It is important that the EDENCP facilitates the process of knowledge building, sharing, and developing <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	7) It is important that the EDENCP be used for different fields of study and work <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	8) It is important that the EDENCP be open for all people to contribute <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	9) It is important that the EDENCP provides three levels of access (for three groups of users: partners, administrators, and general users) <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
Behavioral (this relates to the principles, policies,	10) It is important that the EDENCP could be available in different languages <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	11) It is important that the EDENCP facilitates different forms of communication (virtual, physical, or mixed) <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	12) It is important that the EDENCP provides a common collaboration space to be used by different settings such as educational, industrial, services, and labs <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	13) It is important that the EDENCP provides a supportive environment in which users help each other <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
I do not know	I am not sure				
	14) It is important that the EDENCP simulates the ways users collaborate toward building a dynamic hub <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	15) The partners and administrators have the authority to bring about structural changes in the EDENCP <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
		SDA	DA	A	SA

and governance rules that drive the behaviour of the hub)	16) The general users do not have the authority to make technical changes in the EDENCP (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	17) The general users can contribute to decision-making processes (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	18) It is important that the governance rules for the original hub are defined in a collaborative and democratic way (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	19) To build trust, the EDENCP must make transparency part of hub policy (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	20) It is important that the EDENCP provides a "rewarding system" (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	21) It is important that the EDENCP supports developing transversal skills (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	22) It is important that the EDENCP provides a "conflict resolution system" (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	22) It is important that the EDENCP provides a "conflict resolution system" (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	I do not know	I am not sure	
Admission (this relates to the process or fact of entering or being allowed to enter the hub)	Inclusion	SDA DA	A SA
	23) It is important that the EDENCP facilitates the process of joining (inclusion) to the groups, hubs, and communities (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	24) It is important that the EDENCP provides free access for all users? (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	25) It is important that the EDENCP provides a service for identifying and inviting a group of participants such as, trainers, experts, technical, and managerial? (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	26) It is important that all the users actively take part in introducing the hub to potential and interested persons? (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	27) It is important that the EDENCP suspends or even deactivates a user's account who does not follow the rules (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	28) Users can stop their contribution at any time (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	29) It is important that the users make notifications before stopping their contributions (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	Accessability and Proximity	SDA DA	A SA
	30) To promote the quality of contributions and develop transparency, it is important that the EDENCP reduces anonymity (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	31) To reduce anonymity, it is important that the users create a user account and register by providing their personal information (e.g., full name, profession, e-mail address, and photo) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	32) It is important that the EDENCP incentives the user to continue contributing (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	33) It is important that the EDENCP tracks the time-outs (to check if there is a problem with the user or the service) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	34) It is important that the username be associated with the user's contributions (to facilitate the monitoring of contributions) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	Structural (this relates to the network structure such as participants, relationships, roles, and network typology)	Participants	SDA DA
35) It is important that the users from any age, background, culture, and gender contribute to EDENCP (<i>if you have any suggestions for this issue, please feel free to let us know</i>) ...		I do not know	I am not sure
36) Users will not be paid, and they will contribute on the volunteer base (<i>if you have any suggestions for this issue, please feel free to let us know</i>)		SDA DA	A SA
37) It is important that the EDENCP provides different services for diverse groups (e.g., learners, trainers, experts, researchers, academics, managers, and entrepreneurs) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)		I do not know	I am not sure
38) It is important that the EDENCP delivers services for people from outside a specific group, hub, and community (<i>if you have any suggestions for this issue, please feel free to let us know</i>)		SDA DA	A SA
39) It is important that the EDENCP provides some services for people with special needs (e.g., people with disabilities) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)		I do not know	I am not sure
	SDA DA	A SA	

	40 It is important that the users could participate in the activities that they are interested in and have a background in (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	41 It is important that the users could make a list of the useful things that he can bring to the hub (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	42 It is important that the EDENCP makes a list of the services that it can deliver (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	Roles and Tasks		
	43 It is important that the users could play distinct roles (e.g., expert, advisor, trainer, trainee, editorial, researcher, technical, managerial) based on their qualifications (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	44 It is important that the users could engage in multiple tasks (e.g., training execution, providing learning contents, delivering the contents, exchanging the contents, executing, providing supports, commenting, reporting) based on their interests and capabilities (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	45 It is important that the users could simultaneously contribute to different domains, courses, majors, practices, issues, and events (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	46 It is important that the users could support the process of developing curricula (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	47 It is important that the users could support the process of training (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	48 It is important that the users could support the process of competency development (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	49 It is important that the users could support the contributions from different people (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	Collaboration		
Social (this relates to the collaborative activities and interactions between the participants and hubs)	50 It is important that the EDENCP builds a network for career development (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	51 It is important that the users could learn new things collaboratively (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	52 It is important that the users could solve the problems collaboratively (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	53 It is important that the EDENCP could provide computer-supported collaborative tools for collaboration (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	54 It is important that the EDENCP could provide a "discussion forum" for collaboration (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	55 It is important that the users could build interdisciplinary collaboration (a collaboration that involves individuals from different teams, disciplines, and backgrounds) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	56 It is important that the EDENCP could support building strategic partnerships and alliances with potential external parties (to share the resources and expertise) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	Content Management		
Functional (this relates to the base functions, operations, running, and procedures in the hub)	57 It is important that the EDENCP could make accessible the created and developed content for all users (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	58 It is important that the users could support the process of creating, sharing, and developing the contents (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	59 It is important that the EDENCP could provide a "voting system" for evaluating the quality of created contents (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	60 It is important that the EDENCP could continually develop and update the contents (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	61 It is important that the EDENCP could classify the developed contents into specific courses and majors (based on predefined topics) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA





	62) It is important that the EDENCP could save the developed contents in a secured database (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	63) It is important that the EDENCP could publish some of the important discoveries, developments, and Transversal Competences (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	Operation Management		
	64) It is important that the EDENCP could continuously promote its operational processes (set of activities or tasks that produces a specific service) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	65) It is important that the EDENCP could save users' personal information and contributions in their profile (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	66) It is important that the EDENCP could provide a "monitoring system" to constantly monitor the transactions (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	67) It is important that the EDENCP could provide a "benchmarking system" to regularly evaluate the performances (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	68) It is important that when someone breaks the rules, EDENCP could take the needed actions (e.g., sends a warning message to the account, removes it, or blocks the account) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	69) It is important that the EDENCP could unblock the owner of the blocked account if he promises to follow the rules in the future (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	Interaction Management		
	70) It is important that the EDENCP could provide an appropriate service for internal interactions such as sharing the resources, training, and learning materials (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	71) It is important that the EDENCP could provide an appropriate service for external interactions such as exchanging the expertise and findings (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	72) It is important that the EDENCP could provide multiple communication channels (e.g., email, live chat, message board, wiki, and social networks) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	73) It is important that the EDENCP could occasionally evaluate communication activities (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	74) It is important that the EDENCP could provide a Real-Time Interaction Management (that generates contextually relevant and personalized messages and offers, within the context of the user interaction) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	75) It is important that the EDENCP could provide opportunities for external interactions with similar hubs and communities (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	Human Resource Management		
	76) The users should be treated equally (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	77) It is important that the EDENCP could encourage the users to make themselves known to the public (by providing their background knowledge and expertise) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	78) It is important that the EDENCP could provide an advisory board (for each field of study, major, or course) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	79) It is important that the EDENCP could retain effective users (for example by giving rank, badge, and more access) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	80) It is important that the EDENCP could provide a question-and-answer board for the users' issues and inquiries (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	81) It is important that the EDENCP could use outsourced talents (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	Supports and Services		
Economical	How important do you think the following services could be for the economic sustainability of the platform:		
		SDA DA	A SA

(this relates to the supportive services that could be provided internally and/or externally)	82) Benefiting from private and public funding, grants, financial aids and donations, capital from investors and sponsors, and advertising (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	83) Providing supportive training and learning services for schools, organizations, institutions, businesses, and companies (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	84) Providing supportive training and learning services for social media markets (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	85) Providing counselling services (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	86) Providing supportive services for research practices, and publications (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	87) Providing supportive services for conferences, and workshops (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	88) Providing material and financial supports for innovators (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	89) Developing a program that assists and guides the users in making occupational choices (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	90) Provide a support service that facilitates learning for people with disabilities (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	91) Providing a service for companies that look for persons having specific TRANSVERSAL COMPETENCES (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
	Technological (this relates to using technical means and interconnected components)	92) It is important that the EDENCP could provide web-based communication (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know
93) It is important that the EDENCP could use ICT technologies to manage communications processes (<i>if you have any suggestions for this issue, please feel free to let us know</i>)		SDA DA	A SA
94) It is important that the EDENCP could benefit from Computer-Supported Collaborative Learning (<i>if you have any suggestions for this issue, please feel free to let us know</i>)		I do not know	I am not sure
95) It is important that the EDENCP could make links with social media platforms (to facilitate communications) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)		SDA DA	A SA
96) It is important that the EDENCP could provide a search engine that helps participants to find information and services provided in the hub (<i>if you have any suggestions for this issue, please feel free to let us know</i>)		I do not know	I am not sure
97) It is important that the EDENCP could use potential tools for assessing the performances (<i>if you have any suggestions for this issue, please feel free to let us know</i>) ...		SDA DA	A SA
98) It is important that the EDENCP could provide sufficient technological services that support collaboration (<i>if you have any suggestions for this issue, please feel free to let us know</i>)		I do not know	I am not sure
99) It is important that the EDENCP could receive external technological supports (<i>if you have any suggestions for this issue, please feel free to let us know</i>)		SDA DA	A SA
100) It is important that the EDENCP could save the interactions in a secure database (<i>if you have any suggestions for this issue, please feel free to let us know</i>)		I do not know	I am not sure

5. Questionnaire for Developing the ED-EN HUBs Collaboration Platform (EDENCP)

EDENCP provides a supported training and learning hub where an unlimited number of distributed but enthusiastic trainers and learners from diverse backgrounds come together to build a long-term collaboration.

Table 3. Developed questionnaire for identifying the key features that might be integrated into the platform.

Questionnaire for Developing the ED-EN HUBs Collaboration Platform (EDENCP)					
EDENCP provides a supported training and learning hub where an unlimited number of distributed but enthusiastic trainers and learners from diverse backgrounds come together to build a long-term collaboration. The participants in the hub will attempt to establish new ways and develop more scenarios for sharing their knowledge, experiences, and ideas which can help to develop their level of education, qualifications, and competencies.					
Considered Dimensions	Main Features That Might be Integrated into Platform	Checklist			
					
Organizational (This relates to the organization of the hub or the way it is set up. It is also related to the action of organizing something)	1) It is important that the EDENCP be a user-driven service (users may be co-creators of the service) <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	2) It is important that even general users could help (the partners and administrators) to develop the EDENCP <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	3) It is important that the EDENCP engages diverse groups (e.g., public, experts, and professionals) in the process of learning <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	4) It is important that the EDENCP provides opportunities for collective learning <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
I do not know	I am not sure				
Environmental (this relates to the hub's surroundings and the impact of participants' activities on its condition)	5) It is important that the EDENCP be used for different purposes (e.g., education, tutorials, developing competencies, promoting workforces, R&D) <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	6) It is important that the EDENCP facilitates the process of knowledge building, sharing, and developing <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	7) It is important that the EDENCP be used for different fields of study and work <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	8) It is important that the EDENCP be open for all people to contribute <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	9) It is important that the EDENCP provides three levels of access (for three groups of users: partners, administrators, and general users) <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
Behavioral (this relates to the principles, policies, and governance rules that drive the behaviour of the hub)	10) It is important that the EDENCP could be available in different languages <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	11) It is important that the EDENCP facilitates different forms of communication (virtual, physical, or mixed) <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	12) It is important that the EDENCP provides a common collaboration space to be used by different settings such as educational, industrial, services, and labs <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	13) It is important that the EDENCP provides a supportive environment in which users help each other <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	14) It is important that the EDENCP simulates the ways users collaborate toward building a dynamic hub <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	15) The partners and administrators have the authority to bring about structural changes in the EDENCP <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	16) The general users do not have the authority to make technical changes in the EDENCP <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
	I do not know	I am not sure			
	17) The general users can contribute to decision-making processes <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
I do not know	I am not sure				
18) It is important that the governance rules for the original hub are defined in a collaborative and democratic way <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA	
I do not know	I am not sure				
19) To build trust, the EDENCP must make transparency part of hub policy <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA	
I do not know	I am not sure				
20) It is important that the EDENCP provides a "rewarding system" <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA	
I do not know	I am not sure				
21) It is important that the EDENCP supports developing transversal skills <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA	
I do not know	I am not sure				
22) It is important that the EDENCP provides a "conflict resolution system" <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA	
I do not know	I am not sure				
Inclusion					

Admission (this relates to the process or fact of entering or being allowed to enter the hub)	23 It is important that the EDENCP facilitates the process of joining (inclusion) to the groups, hubs, and communities (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	24 It is important that the EDENCP provides free access for all users? (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	25 It is important that the EDENCP provides a service for identifying and inviting a group of participants such as, trainers, experts, technical, and managerial? (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	26 It is important that all the users actively take part in introducing the hub to potential and interested persons? (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	27 It is important that the EDENCP suspends or even deactivates a user's account who does not follow the rules (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	28 Users can stop their contribution at any time (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	29 It is important that the users make notifications before stopping their contributions (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
Accessibility and Proximity					
30 To promote the quality of contributions and develop transparency, it is important that the EDENCP reduces anonymity (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA	
	I do not know		I am not sure		
31 To reduce anonymity, it is important that the users create a user account and register by providing their personal information (e.g., full name, profession, e-mail address, and photo) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA	
	I do not know		I am not sure		
32 It is important that the EDENCP incentives the user to continue contributing (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA	
	I do not know		I am not sure		
33 It is important that the EDENCP tracks the time-outs (to check if there is a problem with the user or the service) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA	
	I do not know		I am not sure		
34 It is important that the username be associated with the user's contributions (to facilitate the monitoring of contributions) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA	
	I do not know		I am not sure		
Participants					
Structural (this relates to the network structure such as participants, relationships, roles, and network typology)	35 It is important that the users from any age, background, culture, and gender contribute to EDENCP (<i>if you have any suggestions for this issue, please feel free to let us know</i>) ...	SDA	DA	A	SA
		I do not know		I am not sure	
	36 Users will not be paid, and they will contribute on the volunteer base (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	37 It is important that the EDENCP provides different services for diverse groups (e.g., learners, trainers, experts, researchers, academics, managers, and entrepreneurs) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	38 It is important that the EDENCP delivers services for people from outside a specific group, hub, and community (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	39 It is important that the EDENCP provides some services for people with special needs (e.g., people with disabilities) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	40 It is important that the users could participate in the activities that they are interested in and have a background in (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	41 It is important that the users could make a list of the useful things that he can bring to the hub (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
42 It is important that the EDENCP makes a list of the services that it can deliver (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA	
	I do not know		I am not sure		
Roles and Tasks					
43 It is important that the users could play distinct roles (e.g., expert, advisor, trainer, trainee, editorial, researcher, technical, managerial) based on their qualifications (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA	
	I do not know		I am not sure		
44 It is important that the users could engage in multiple tasks (e.g., training execution, providing learning contents, delivering the contents, exchanging the contents, executing, providing supports, commenting, reporting) based on their interests and capabilities (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA	
	I do not know		I am not sure		





	45) It is important that the users could simultaneously contribute to different domains, courses, majors, practices, issues, and events (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	46) It is important that the users could support the process of developing curricula (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	47) It is important that the users could support the process of training (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	48) It is important that the users could support the process of competency development (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	49) It is important that the users could support the contributions from different people (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	Collaboration				
Social (this relates to the collaborative activities and interactions between the participants and hubs)	50) It is important that the EDENCP builds a network for career development (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	51) It is important that the users could learn new things collaboratively (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	52) It is important that the users could solve the problems collaboratively (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	53) It is important that the EDENCP could provide computer-supported collaborative tools for collaboration (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
54) It is important that the EDENCP could provide a "discussion forum" for collaboration (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA	
	I do not know		I am not sure		
55) It is important that the users could build interdisciplinary collaboration (a collaboration that involves individuals from different teams, disciplines, and backgrounds) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA	
	I do not know		I am not sure		
56) It is important that the EDENCP could support building strategic partnerships and alliances with potential external parties (to share the resources and expertise) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA	
	I do not know		I am not sure		
	Content Management				
Functional (this relates to the base functions, operations, running, and procedures in the hub)	57) It is important that the EDENCP could make accessible the created and developed content for all users (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	58) It is important that the users could support the process of creating, sharing, and developing the contents (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	59) It is important that the EDENCP could provide a "voting system" for evaluating the quality of created contents (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	60) It is important that the EDENCP could continually develop and update the contents (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	61) It is important that the EDENCP could classify the developed contents into specific courses and majors (based on predefined topics) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
		I do not know		I am not sure	
	62) It is important that the EDENCP could save the developed contents in a secured database (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA
	I do not know		I am not sure		
63) It is important that the EDENCP could publish some of the important discoveries, developments, and Transversal Competences (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA	
	I do not know		I am not sure		
	Operation Management				
64) It is important that the EDENCP could continuously promote its operational processes (set of activities or tasks that produces a specific service) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA	
	I do not know		I am not sure		
65) It is important that the EDENCP could save users' personal information and contributions in their profile (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA	
	I do not know		I am not sure		
66) It is important that the EDENCP could provide a "monitoring system" to constantly monitor the transactions (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA	
	I do not know		I am not sure		
67) It is important that the EDENCP could provide a "benchmarking system" to regularly evaluate the performances (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA	DA	A	SA	
	I do not know		I am not sure		

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	68 It is important that when someone breaks the rules, EDENCP could take the needed actions (e.g., sends a warning message to the account, removes it, or blocks the account) <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
	69 It is important that the EDENCP could unblock the owner of the blocked account if he promises to follow the rules in the future <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
	Interaction Management				
	70 It is important that the EDENCP could provide an appropriate service for internal interactions such as sharing the resources, training, and learning materials <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
	71 It is important that the EDENCP could provide an appropriate service for external interactions such as exchanging the expertise and findings <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
	72 It is important that the EDENCP could provide multiple communication channels (e.g., email, live chat, message board, wiki, and social networks) <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
	73 It is important that the EDENCP could occasionally evaluate communication activities <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
	74 It is important that the EDENCP could provide a Real-Time Interaction Management (that generates contextually relevant and personalized messages and offers, within the context of the user interaction) <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
	75 It is important that the EDENCP could provide opportunities for external interactions with similar hubs and communities <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
	Human Resource Management				
	76 The users should be treated equally <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
	77 It is important that the EDENCP could encourage the users to make themselves known to the public (by providing their background knowledge and expertise) <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
	78 It is important that the EDENCP could provide an advisory board (for each field of study, major, or course) <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
	79 It is important that the EDENCP could retain effective users (for example by giving rank, badge, and more access) <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
	80 It is important that the EDENCP could provide a question-and-answer board for the users' issues and inquiries <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
	81 It is important that the EDENCP could use outsourced talents <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
	Supports and Services				
Economical (this relates to the supportive services that could be provided internally and/or externally)	How important do you think the following services could be for the economic sustainability of the platform:				
	82 Benefiting from private and public funding, grants, financial aids and donations, capital from investors and sponsors, and advertising <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
	83 Providing supportive training and learning services for schools, organizations, institutions, businesses, and companies <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
	84 Providing supportive training and learning services for social media markets <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
	85 Providing counselling services <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
	86 Providing supportive services for research practices, and publications <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA
		I do not know		I am not sure	
87 Providing supportive services for conferences, and workshops <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA	
	I do not know		I am not sure		
88 Providing material and financial supports for innovators <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA	
	I do not know		I am not sure		
89 Developing a program that assists and guides the users in making occupational choices <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA	DA	A	SA	
	I do not know		I am not sure		
		SDA	DA	A	SA

	90) Provide a support service that facilitates learning for people with disabilities (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure
	91) Providing a service for companies that look for persons having specific TRANSVERSAL COMPETENCES (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
Technological (this relates to using technical means and interconnected components)	92) It is important that the EDENCP could provide web-based communication (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	93) It is important that the EDENCP could use ICT technologies to manage communications processes (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	94) It is important that the EDENCP could benefit from Computer-Supported Collaborative Learning (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	95) It is important that the EDENCP could make links with social media platforms (to facilitate communications) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	96) It is important that the EDENCP could provide a search engine that helps participants to find information and services provided in the hub (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	97) It is important that the EDENCP could use potential tools for assessing the performances (<i>if you have any suggestions for this issue, please feel free to let us know</i>) ...	SDA DA	A SA
		I do not know	I am not sure
	98) It is important that the EDENCP could provide sufficient technological services that support collaboration (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	99) It is important that the EDENCP could receive external technological supports (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure
	100) It is important that the EDENCP could save the interactions in a secure database (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA
		I do not know	I am not sure

Questionnaire for Developing the ED-EN HUBs Collaboration Platform (EDENCP)				
EDENCP provides a supported training and learning hub where an unlimited number of distributed but enthusiastic trainers and learners from diverse backgrounds come together to build a long-term collaboration. The participants in the hub will attempt to establish new ways and develop more scenarios for sharing their knowledge, experiences, and ideas which can help to develop their level of education, qualifications, and competencies.				
Considered Dimensions	Main Features That Might be Integrated into Platform	Checklist		
Organizational (This relates to the organization of the hub or the way it is set up. It is also related to the action of organizing something)	1) It is important that the EDENCP be a user-driven service (users may be co-creators of the service) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	   	SDA DA	A SA
		I do not know	I am not sure	
	2) It is important that even general users could help (the partners and administrators) to develop the EDENCP (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
		I do not know	I am not sure	
	3) It is important that the EDENCP engages diverse groups (e.g., public, experts, and professionals) in the process of learning (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
		I do not know	I am not sure	
	4) It is important that the EDENCP provides opportunities for collective learning (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
	I do not know	I am not sure		
	5) It is important that the EDENCP be used for different purposes (e.g., education, tutorials, developing competencies, promoting workforces, R&D) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
		I do not know	I am not sure	
	6) It is important that the EDENCP facilitates the process of knowledge building, sharing, and developing (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
		I do not know	I am not sure	
	7) It is important that the EDENCP be used for different fields of study and work (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
		I do not know	I am not sure	
Environmental (this relates to the hub's surroundings and the impact of participants')	8) It is important that the EDENCP be open for all people to contribute (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
		I do not know	I am not sure	
	9) It is important that the EDENCP provides three levels of access (for three groups of users: partners, administrators, and general users) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
	I do not know	I am not sure		
	10) It is important that the EDENCP could be available in different languages (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
		I do not know	I am not sure	

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activities on its condition)	11) It is important that the EDENCP facilitates different forms of communication (virtual, physical, or mixed) (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA	
		I do not know		I am not sure		
	12) It is important that the EDENCP provides a common collaboration space to be used by different settings such as educational, industrial, services, and labs (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA	
		I do not know		I am not sure		
	13) It is important that the EDENCP provides a supportive environment in which users help each other (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA	
		I do not know		I am not sure		
	14) It is important that the EDENCP simulates the ways users collaborate toward building a dynamic hub (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA	
		I do not know		I am not sure		
Behavioral (this relates to the principles, policies, and governance rules that drive the behaviour of the hub)	15) The partners and administrators have the authority to bring about structural changes in the EDENCP (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA	
		I do not know		I am not sure		
	16) The general users do not have the authority to make technical changes in the EDENCP (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA	
		I do not know		I am not sure		
	17) The general users can contribute to decision-making processes (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA	
		I do not know		I am not sure		
	18) It is important that the governance rules for the original hub are defined in a collaborative and democratic way (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA	
		I do not know		I am not sure		
	19) To build trust, the EDENCP must make transparency part of hub policy (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA	
		I do not know		I am not sure		
Admission (this relates to the process or fact of entering or being allowed to enter the hub)	20) It is important that the EDENCP provides a "rewarding system" (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA	
		I do not know		I am not sure		
	21) It is important that the EDENCP supports developing transversal skills (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA	
		I do not know		I am not sure		
	22) It is important that the EDENCP provides a "conflict resolution system" (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA	
		I do not know		I am not sure		
	Inclusion					
	23) It is important that the EDENCP facilitates the process of joining (inclusion) to the groups, hubs, and communities (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA	
		I do not know		I am not sure		
	24) It is important that the EDENCP provides free access for all users? (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA	
	I do not know		I am not sure			
25) It is important that the EDENCP provides a service for identifying and inviting a group of participants such as, trainers, experts, technical, and managerial? (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA		
	I do not know		I am not sure			
26) It is important that all the users actively take part in introducing the hub to potential and interested persons? (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA		
	I do not know		I am not sure			
27) It is important that the EDENCP suspends or even deactivates a user's account who does not follow the rules (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA		
	I do not know		I am not sure			
28) Users can stop their contribution at any time (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA		
	I do not know		I am not sure			
29) It is important that the users make notifications before stopping their contributions (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA		
	I do not know		I am not sure			
Accessibility and Proximity						
30) To promote the quality of contributions and develop transparency, it is important that the EDENCP reduces anonymity (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA		
	I do not know		I am not sure			
31) To reduce anonymity, it is important that the users create a user account and register by providing their personal information (e.g., full name, profession, e-mail address, and photo) (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA		
	I do not know		I am not sure			
32) It is important that the EDENCP incentives the user to continue contributing (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA		
	I do not know		I am not sure			
33) It is important that the EDENCP tracks the time-outs (to check if there is a problem with the user or the service) (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA		
	I do not know		I am not sure			
34) It is important that the username be associated with the user's contributions (to facilitate the monitoring of contributions) (if you have any suggestions for this issue, please feel free to let us know)	SDA	DA	A	SA		
	I do not know		I am not sure			
Participants						
	SDA	DA	A	SA		

Structural (this relates to the network structure such as participants, relationships, roles, and network typology)	35) It is important that the users from any age, background, culture, and gender contribute to EDENCP (<i>if you have any suggestions for this issue, please feel free to let us know</i>) ...	I do not know	I am not sure	
	36) Users will not be paid, and they will contribute on the volunteer base (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA A SA	I do not know I am not sure	
	37) It is important that the EDENCP provides different services for diverse groups (e.g., learners, trainers, experts, researchers, academics, managers, and entrepreneurs) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA A SA	I do not know I am not sure	
	38) It is important that the EDENCP delivers services for people from outside a specific group, hub, and community (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA A SA	I do not know I am not sure	
	39) It is important that the EDENCP provides some services for people with special needs (e.g., people with disabilities) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA A SA	I do not know I am not sure	
	40) It is important that the users could participate in the activities that they are interested in and have a background in (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA A SA	I do not know I am not sure	
	41) It is important that the users could make a list of the useful things that he can bring to the hub (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA A SA	I do not know I am not sure	
	42) It is important that the EDENCP makes a list of the services that it can deliver (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA A SA	I do not know I am not sure	
	Roles and Tasks			
	43) It is important that the users could play distinct roles (e.g., expert, advisor, trainer, trainee, editorial, researcher, technical, managerial) based on their qualifications (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA A SA	I do not know I am not sure	
	44) It is important that the users could engage in multiple tasks (e.g., training execution, providing learning contents, delivering the contents, exchanging the contents, executing, providing supports, commenting, reporting) based on their interests and capabilities (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA A SA	I do not know I am not sure	
	45) It is important that the users could simultaneously contribute to different domains, courses, majors, practices, issues, and events (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA A SA	I do not know I am not sure	
	46) It is important that the users could support the process of developing curricula (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA A SA	I do not know I am not sure	
	47) It is important that the users could support the process of training (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA A SA	I do not know I am not sure	
	48) It is important that the users could support the process of competency development (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA A SA	I do not know I am not sure	
	49) It is important that the users could support the contributions from different people (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA A SA	I do not know I am not sure	
	Collaboration			
	Social (this relates to the collaborative activities and interactions between the participants and hubs)	50) It is important that the EDENCP builds a network for career development (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA A SA	I do not know I am not sure
51) It is important that the users could learn new things collaboratively (<i>if you have any suggestions for this issue, please feel free to let us know</i>)		SDA DA A SA	I do not know I am not sure	
52) It is important that the users could solve the problems collaboratively (<i>if you have any suggestions for this issue, please feel free to let us know</i>)		SDA DA A SA	I do not know I am not sure	
53) It is important that the EDENCP could provide computer-supported collaborative tools for collaboration (<i>if you have any suggestions for this issue, please feel free to let us know</i>)		SDA DA A SA	I do not know I am not sure	
54) It is important that the EDENCP could provide a "discussion forum" for collaboration (<i>if you have any suggestions for this issue, please feel free to let us know</i>)		SDA DA A SA	I do not know I am not sure	
55) It is important that the users could build interdisciplinary collaboration (a collaboration that involves individuals from different teams, disciplines, and backgrounds) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)		SDA DA A SA	I do not know I am not sure	
56) It is important that the EDENCP could support building strategic partnerships and alliances with potential external parties (to share the resources and expertise) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)		SDA DA A SA	I do not know I am not sure	
Content Management				
	SDA DA A SA			

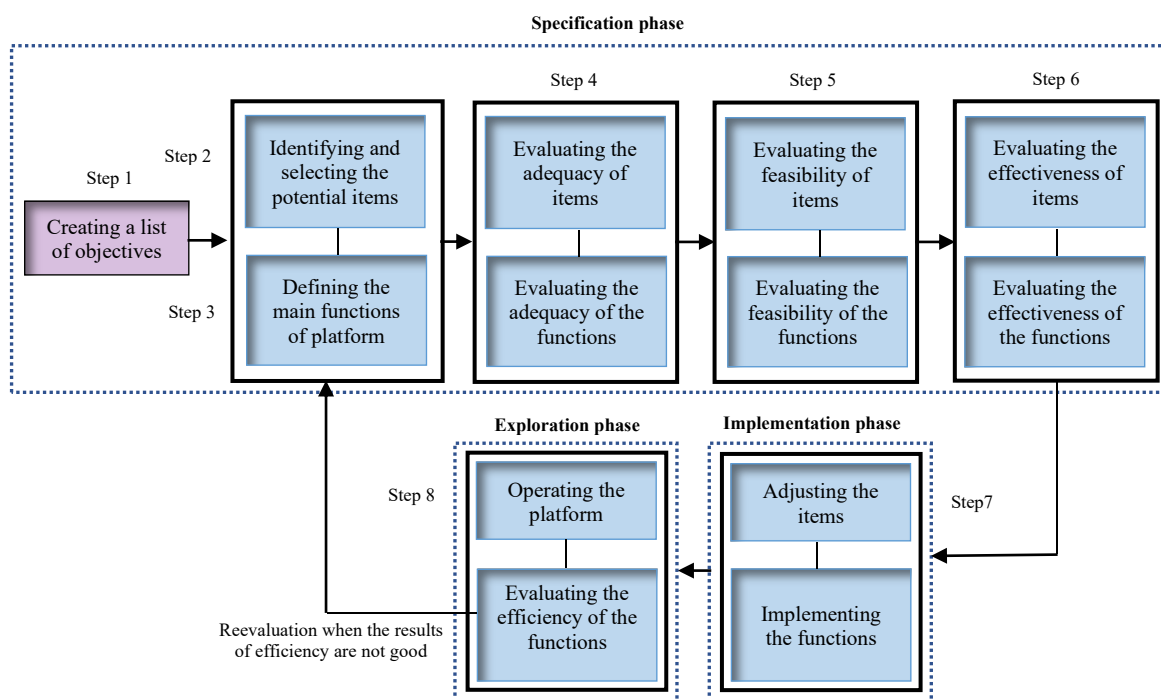
Functional (this relates to the base functions, operations, running, and procedures in the hub)	57) It is important that the EDENCP could make accessible the created and developed content for all users (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure	
	58) It is important that the users could support the process of creating, sharing, and developing the contents (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
	59) It is important that the EDENCP could provide a "voting system" for evaluating the quality of created contents (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure	
	60) It is important that the EDENCP could continually develop and update the contents (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
	61) It is important that the EDENCP could classify the developed contents into specific courses and majors (based on predefined topics) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure	
	62) It is important that the EDENCP could save the developed contents in a secured database (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
	63) It is important that the EDENCP could publish some of the important discoveries, developments, and Transversal Competences (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure	
	Operation Management			
	64) It is important that the EDENCP could continuously promote its operational processes (set of activities or tasks that produces a specific service) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
	65) It is important that the EDENCP could save users' personal information and contributions in their profile (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure	
	66) It is important that the EDENCP could provide a "monitoring system" to constantly monitor the transactions (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
	67) It is important that the EDENCP could provide a "benchmarking system" to regularly evaluate the performances (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure	
	68) It is important that when someone breaks the rules, EDENCP could take the needed actions (e.g., sends a warning message to the account, removes it, or blocks the account) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
	69) It is important that the EDENCP could unblock the owner of the blocked account if he promises to follow the rules in the future (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure	
	Interaction Management			
	70) It is important that the EDENCP could provide an appropriate service for internal interactions such as sharing the resources, training, and learning materials (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
	71) It is important that the EDENCP could provide an appropriate service for external interactions such as exchanging the expertise and findings (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure	
	72) It is important that the EDENCP could provide multiple communication channels (e.g., email, live chat, message board, wiki, and social networks) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
	73) It is important that the EDENCP could occasionally evaluate communication activities (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure	
	74) It is important that the EDENCP could provide a Real-Time Interaction Management (that generates contextually relevant and personalized messages and offers, within the context of the user interaction) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
	75) It is important that the EDENCP could provide opportunities for external interactions with similar hubs and communities (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure	
	Human Resource Management			
	76) The users should be treated equally (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	SDA DA	A SA	
	77) It is important that the EDENCP could encourage the users to make themselves known to the public (by providing their background knowledge and expertise) (<i>if you have any suggestions for this issue, please feel free to let us know</i>)	I do not know	I am not sure	
		SDA DA	A SA	

	78) It is important that the EDENCP could provide an advisory board (for each field of study, major, or course) <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure
	79) It is important that the EDENCP could retain effective users (for example by giving rank, badge, and more access) <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA
	80) It is important that the EDENCP could provide a question-and-answer board for the users' issues and inquiries <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure
	81) It is important that the EDENCP could use outsourced talents <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA
	81) It is important that the EDENCP could use outsourced talents <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure
	Supports and Services		
	How important do you think the following services could be for the economic sustainability of the platform:		
Economical (this relates to the supportive services that could be provided internally and/or externally)	82) Benefiting from private and public funding, grants, financial aids and donations, capital from investors and sponsors, and advertising <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA
	83) Providing supportive training and learning services for schools, organizations, institutions, businesses, and companies <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure
	83) Providing supportive training and learning services for schools, organizations, institutions, businesses, and companies <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA
	84) Providing supportive training and learning services for social media markets <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure
	84) Providing supportive training and learning services for social media markets <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA
	85) Providing counselling services <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure
	85) Providing counselling services <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA
	86) Providing supportive services for research practices, and publications <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure
	86) Providing supportive services for research practices, and publications <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA
	87) Providing supportive services for conferences, and workshops <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure
	87) Providing supportive services for conferences, and workshops <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA
	88) Providing material and financial supports for innovators <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure
	88) Providing material and financial supports for innovators <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA
89) Developing a program that assists and guides the users in making occupational choices <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure	
89) Developing a program that assists and guides the users in making occupational choices <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA	
90) Provide a support service that facilitates learning for people with disabilities <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure	
90) Provide a support service that facilitates learning for people with disabilities <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA	
91) Providing a service for companies that look for persons having specific TRANSVERSAL COMPETENCES <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure	
91) Providing a service for companies that look for persons having specific TRANSVERSAL COMPETENCES <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA	
Technological (this relates to using technical means and interconnected components)	92) It is important that the EDENCP could provide web-based communication <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA
	92) It is important that the EDENCP could provide web-based communication <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure
	93) It is important that the EDENCP could use ICT technologies to manage communications processes <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA
	93) It is important that the EDENCP could use ICT technologies to manage communications processes <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure
	94) It is important that the EDENCP could benefit from Computer-Supported Collaborative Learning <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA
	94) It is important that the EDENCP could benefit from Computer-Supported Collaborative Learning <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure
	95) It is important that the EDENCP could make links with social media platforms (to facilitate communications) <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA
	95) It is important that the EDENCP could make links with social media platforms (to facilitate communications) <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure
	96) It is important that the EDENCP could provide a search engine that helps participants to find information and services provided in the hub <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA
	96) It is important that the EDENCP could provide a search engine that helps participants to find information and services provided in the hub <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure
97) It is important that the EDENCP could use potential tools for assessing the performances <i>(if you have any suggestions for this issue, please feel free to let us know)</i> ...	SDA DA	A SA	
97) It is important that the EDENCP could use potential tools for assessing the performances <i>(if you have any suggestions for this issue, please feel free to let us know)</i> ...	I do not know	I am not sure	
98) It is important that the EDENCP could provide sufficient technological services that support collaboration <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA	
98) It is important that the EDENCP could provide sufficient technological services that support collaboration <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure	
99) It is important that the EDENCP could receive external technological supports <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA	
99) It is important that the EDENCP could receive external technological supports <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure	
100) It is important that the EDENCP could save the interactions in a secure database <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	SDA DA	A SA	
100) It is important that the EDENCP could save the interactions in a secure database <i>(if you have any suggestions for this issue, please feel free to let us know)</i>	I do not know	I am not sure	

6. Meeting date: 22.12.2021: Evaluation Process

To evaluate the appropriateness and usefulness of the identified and selected components, features, and factors in building the digital platform, an evaluation process is proposed, aiming to critically evaluate the appropriateness of selected items in collaboration with other partners of the project. The proposed evaluation process represents a set of phases and steps through which several tasks will be performed. The evaluation process is depicted in Figure 4.

Figure 4. Proposed evaluation process for assessing the selected items



As illustrated in Figure 4, the evaluation process consists of three phases (specification, implementation, and exploration) and eight steps that are briefly explained in the following:

Specification phase—encompasses steps 1 to 6. It refers to the identification, selection, and documentation of the specific objectives, dimensions, requirements, and functions to be considered for the platform:

- Step 1 – Specifying project objectives: These objectives indicate the specific and actionable targets that need to be achieved by the platform within the period of the project. These objectives are addressed in Table 1.
- Step 2 – Identifying and selecting the potential items (components, features, and factors) that can be used in building the platform: the selected items are

identified by reviewing and analysing the examples listed in Table 2. These items are also represented by a number of questions addressed in Table 3. The selected items should be then customized based on the specific objectives, requirements, and functions of the platform.

- Step 3 – Determining the main functions of the platform: the functions refer to action executions and transactions of the platform. Considering the objectives and requirements of the platform, 8 functions were initially proposed to provide a clear vision of the activities that should be performed against the considered objectives.
- Step 4 – Evaluating the adequacy of the selected items and the defined functions: this step first evaluates whether or not the selected items can reasonably and adequately meet the objectives of the platform. This task was performed by using an instrument (questionnaire) shown in Table 4. Similarly, the adequacy of the defined functions can be collaboratively evaluated in relation to the objectives of the platform.
- Step 5 – Evaluating the feasibility of the selected items and the defined functions: The first part of this step of evaluation tries to uncover the strengths and weaknesses of the selected items from the feasibility point of view. The feasibility can be assessed by considering the technical capabilities and the budget available for implementing the platform. This task should be performed by means of the second questionnaire (Table 8). The feasibility of the functions is pertinent to adjusting the number of functions that could be performed by the platform and developing their descriptions.
- Step 6 – Evaluating the effectiveness of the selected items and the defined functions: this step first evaluated the effectiveness of selected items, aiming at reducing the number of wasted resources that are used to develop the platform as well as reaching the desired results. This task can be performed by using the third questionnaire (Table 11). The effectiveness of defined functions was assessed through some round-group discussions by partners.

Implementation phase—embraces step 7. It focuses on designing, developing, and implementing the assets (the selected items and the defined functions):

- Step 7 – Deals with (a) making the desired changes and justifications on selected items and then realizing and designing them, and (b) implementing (e.g., programming) the defined functions to make the functions/services available for users.

Exploration phase: Includes the last step (8) of the evaluation process. It takes care of the operation and function of the platform and the efficiency of its performance at different levels:

- Step 8 – Oversees the operation of the MCL initiative and helps make it activated and operative as a service. When the platform worked for a certain period, its efficiency should then be evaluated, for example, by taking the same procedures used in previous steps. In this step, if any problem related

to different parts of the platform is detected (indicating that the platform does not work efficiently as expected), it should then be re-evaluated.

Given the above, the actions to be performed and the progress to be made by the platform specification are briefly explained in the following sections:

7. Specifying Project Objectives (Step 1)

In the first step, the following five objectives are collaboratively created (by the project partners and stakeholders) to help in setting the goals in a way that all platform's (EDENCP) activities converge in one single direction:

- **Objective 1** – identifying skills requirements that address the main general and specific skills as well as Transversal Competences that are applicable to both initial and continuing education (based on the principle of education/enterprise cooperation).
- **Objective 2** – co-designing, developing, and training that provides guidelines and resources that can be used in training events for either people from the educational side who want to implement education–enterprise actions or for people from the business side who need to reinforce their links with the educational system.
- **Objective 3** – detecting, assessing, and clarifying policy recommendations which represents the synthesis of the experiences developed during the project in the five regions targeted by ED-EN Hub. The recommendations will be drafted by classifying and comparing the main policy objectives to which the creation of the joint structure is associated, the range of developed functions and concrete results achieved, difficulties in the start-up, funding and collaboration models, solutions found in consolidating collaboration, models of public-private collaboration, and governance developed.
- **Objective 4** – creating career guidance that presents a complete and secured accompanied pathway for people from their first choice of orientation (at the age of 14, when compulsory education positions the pupil with regard to choosing professional reorientation, through guidance and training in collaboration between the stakeholders in education/training and the company.
- **Objective 5** – organisational benchmarking (benchmarking process description) that clarifies what collaboration activities are expected to take place by means of the platform.

8. Identifying and Selecting the Potential Components, Features, and Factors (Step 2)

As mentioned above, to identify and select the potential items (which could be used in the platform), the structures, models, and methods used in 15 cases of mass collaboration (from different contexts) were reviewed, analysed (see Table 4), and

then customised for application to the platform. Afterward, the selected items were addressed in the adequacy questionnaire (presented in Table 3). Through the process of customisation, the partners and stakeholders attempt to use the proposed items or alter them (if needed) to suit the platform's preferences or requirements. For example, instead of supporting open access to the platform for all people, some access restrictions are considered for the platform.

Table 4. Representative examples of Mass Collaboration (MC) and their positive and negative features

15 Examples of MC and their features	
1. Wikipedia	
<p>➤ Positive Factors</p> <ul style="list-style-type: none"> • Free, contributed by volunteers • Open access • Easy inclusion, anyone can participate • Users can play distinct roles and do different tasks • No power hierarchy, users are treated equally • Articles are continuously developed, updated, and checked • Consensus can be reached through friendly and open discussion 	<p>➤ Negative Factors</p> <ul style="list-style-type: none"> • Wikipedia editors are anonymous • Quantity or frequency of contributions is not controlled • Not all contents are accurate; the scientific level of articles varies • Contents are not free from bias • Anyone can vandalize the articles • Users might have fake credentials
2. Digg	
<p>➤ Positive Factors</p> <ul style="list-style-type: none"> • A user-driven website, open to anybody • Easy inclusion • Log-in is mandatory, users need to create a Digg user account • Users are volunteers and can play separate roles and participate in different tasks • Users can add friends and develop their relationships • Users' information and contributions are associated with their Digg profile • Stories are classified into themes based on topics • Good stories will be promoted • Contents are checked by the system • Digg raises capital from investors 	<p>➤ Negative Factors</p> <ul style="list-style-type: none"> • There is no editorial control on submissions • Influential group of users can affect the information credibility, promotions, burying, and votes • Users cannot share their opinions because Digg lacks commenting features on the website
3. Yahoo! Answers	
<p>➤ Positive Factors</p> <ul style="list-style-type: none"> • Yahoo! Answers was an open learning community, available in 12 languages, and open to all • Users could connect, share info, add comments, ask questions, answer others' questions and/or vote • There were categories with multiple sub-categories for organising the questions • There were "Point System" and "Voting System", • Users could receive a "badge" under their name, e.g., naming them as a "Top Contributor" • Staff could reach various levels of authority and site access • Supportive users were featured on the Yahoo! Answers Blog • The "user moderation system" managed its misuse • Posts could be detached if they received a sufficient negative weight • Supported by funds and financial aides • Provided diverse supportive services 	<p>➤ Negative Factors</p> <ul style="list-style-type: none"> • Users could use any name and photo for opening the account • There was no system to filter the incorrect answers • There were improper grammar and incorrect spelling in the answers • Once the "best answer" was chosen, there was no chance to add more answers nor improvement

4. SETI@home	
<p>➤ Positive Factors</p> <ul style="list-style-type: none"> • Open to anybody • Easy inclusion • Participants are volunteers and can build a team and make competitions • Has a "Voting System" to determine the validity of the results • The "Credit System" monitors how much work is done • It raises financial donations 	<p>➤ Negative Factors</p> <ul style="list-style-type: none"> • The risk of cheating (for gaining credit) is high • Participants might misuse the resources of the projects to gain work-unit results • The projects do not share their resources
5. Scratch	
<p>➤ Positive Factors</p> <ul style="list-style-type: none"> • Open to anybody and available in 70+ languages • It can be used in different settings: schools, libraries, community centres, museums, and homes • Users can ask questions, share their creative ideas, stories, and projects, get feedback, and collaborate with others • If something breaks the community's rules, Scratch will take respective action (e.g., sends a warning to the account, removes it, or blocks the account) 	<p>➤ Negative Factors</p> <ul style="list-style-type: none"> • Without creating an account, users can contribute (e.g., create their own projects, read, and put comments) • Users can create several accounts
6. Galaxy Zoo	
<p>➤ Positive Factors</p> <ul style="list-style-type: none"> • Easy inclusion • Users are volunteer • Creating a user account is necessary • Username is associated with the user's contributions • It uses computer technologies and human intelligence for the classification of galaxies • It monitors and analyses the contributions and transactions • Information is stored in a secured database • It uses "Amazon Web Services" to rapidly serve the website to a large number of people • It raises funds 	<p>➤ Negative Factors</p> <ul style="list-style-type: none"> • Using the real name is not necessary for registration • Personal information cannot be completely removed from the system • The classification system cannot provide feedback about the process of classification
7. Foldit	
<p>➤ Positive Factors</p> <ul style="list-style-type: none"> • Open to all • Easy inclusion, engaging the public and scientific teams in online research • Players can use Foldit forum for collaborations e.g., train new players • It relies on human-computer interaction • It has a "Ranking" and "Awarding System" • The website records, monitors, and stores the posts and interactions • It publishes all important scientific discoveries • The results can be used in scientific publications • It benefits from grants 	<p>➤ Negative Factors</p> <ul style="list-style-type: none"> • Players can play without an account, so there are many anonymous identifiers in the community • It is not easy to learn and play Foldit • Playing Foldit needs a decent computer
8. Applications of the Delphi method	
<p>➤ Positive Factors</p> <ul style="list-style-type: none"> • There are various iterations of the Delphi processes • Each panel could be selected and invited • The experts can discuss or comment on others' forecasts • All the experts and their forecasts are giving equal weight • It can be applied in different fields of science • It can raise funds 	<p>➤ Negative Factors</p> <ul style="list-style-type: none"> • The potential experts might not agree or be available for participation • The method is not able to make complex forecasts with multiple factors • The response times might take several days
9. Climate Collaboration	

<p>➤ Positive Factors</p> <ul style="list-style-type: none"> • Benefits from the contribution of experts and crowds • Easy inclusion • Users are volunteers and can play different roles and perform different tasks • Users can collaborate on the platform with whoever is interested in similar topics • Users can comment on others' proposals • It has a "Voting System", "Rewarding System", "Messaging System", and "expert advisory board" • In the website, there is a list of community members, their points, roles, activities, and membership date • It raises funds and financial supports 	<p>➤ Negative Factors</p> <ul style="list-style-type: none"> • It must continuously identify, invite, and maintain a large number of different expertise • It uses a top-down approach in the community
10. Assignment Zero	
<p>➤ Positive Factors</p> <ul style="list-style-type: none"> • Open to all • Users are volunteers • Users must create a user account by providing their full name and a valid e-mail address • There is a list of tasks that users can perform • Users can contribute to different topics • Users are encouraged to make themselves known to the public by providing their biography • It gives credit to the contributions, and it is supported by funds 	<p>➤ Negative Factors</p> <ul style="list-style-type: none"> • Users might produce, and share stories recognized as useless • Interviews often take place face-to-face, so the candidates must live close to the interviewee
11. Signing-in	
<p>➤ Positive Factors</p> <ul style="list-style-type: none"> • It provides free tools and services • Registration needs a valid email address • There are different forms of communication • All users are considered equal • It benefits from grants and donations 	<p>➤ Negative Factors</p> <ul style="list-style-type: none"> • Users can sign up at the website by using a different email and name • Some sections of the website are available only to donators • For participation in the forum, participants require first donating, and then receiving the license key, registering a forum account, and lastly upgrading their forum account • The contracting and consulting services are not cheap
12. Experts Exchange	
<p>➤ Positive Factors</p> <ul style="list-style-type: none"> • Users must register with an accurate email address • Users are not allowed to have more than one account, • Users are volunteers • EE covers over 230 tech topics and prioritizes the contents based on usefulness • Users can receive recognition and secure credentials with "Credly"¹ (a digital badge platform that provides digital credentials to individuals through working with credible organizations) • EE provides a variety of professional training courses in a wide variety of topics, and it produces various video tutorials 	<p>➤ Negative Factors</p> <ul style="list-style-type: none"> • EE provides answers only via paid mode • If a user account is a past due, EE might cancel his account for non-payment
13. Waze	

¹ <https://info.credly.com>

<p>➤ Positive Factors</p> <ul style="list-style-type: none"> • User-generated community • It is free to download and can be used anywhere • It relies on crowd-sourced information • Users need registration • Users can connect and work together • It offers points to users • Advertising is the main source of generating revenue 	<p>➤ Negative Factors</p> <ul style="list-style-type: none"> • Using Waze needs enough initial and active users to collectively create the local maps and continuously update data to make it useful • Limited number of countries (13) have a full base map, in others either the map is incomplete, or not yet used • Waze currently supports only private cars, not public transportation, bicycle, or trucks
14. Makerspaces	
<p>➤ Positive Factors</p> <ul style="list-style-type: none"> • It is member-driven • It can take different forms (physical, virtual), shapes, sizes, and for different purposes • Most Makerspaces need registration • Users are people with common interests • Users can meet, socialize, and collaborate (on projects), co-create, learn new skills, share, research, explore and invent, prototype, solve problems, play, and even boost self-confidence • It benefits from funds and financial support 	<p>➤ Negative Factors</p> <ul style="list-style-type: none"> • Some Makerspaces have membership fees • Physical Makerspaces have been criticised for their excessive costs associated with tools and materials
15. SAP Community Network	
<p>➤ Positive Factors</p> <p>SAP community network serves as a resource repository and a platform for SAP users to collaborate with each other</p> <ul style="list-style-type: none"> • Software users, developers, consultants, mentors, and students use the SAP Community Network to get help, share ideas, learn, innovate and connect with others • Open to all • Users are volunteers • It offers/hosts discussion forums, tutorials, expert blogs, sap code sharing gallery, utilities, technical library, wiki, article downloads, e-learning catalogues, and other facilities through which its users contribute their knowledge • It has its own channel on YouTube <ul style="list-style-type: none"> • Its users' knowledge contribution to the community can be quantified • It has a contributor recognition program (CRP) that awards points to community users for each technical article, code sample, video, wiki contribution, forum post, and weblog authored. • SAP recognizes its most active contributors • It has over 430 spaces (sub-groups) 	<p>➤ Negative Factors</p> <ul style="list-style-type: none"> • Knowledge flows are not measurable • The questions asked before are not easily accessible • It is impossible to read the list of problems in the scope of the theme • There is no control to navigate to the blogs section directly • It is difficult to find the important and most liked blogs

9. Determining the Main Functions of Platform (Step 3)

Considering Table 1, the following eight functions are collaboratively defined for EDENCP by the project partners and stakeholders:

1. Developing an appropriate search engine
2. Determining the aspects, components, and features of collaboration
3. Managing training process
4. Providing training support

5. Designing curriculum
6. Inserting emergent competence demands
7. Providing suitable tools to evaluate the performances
8. Providing a database and service that introduces and offers promising, validated, and trusted tools.

These functions refer to the platform's functionality, ability, capabilities, and features that all together will provide the defined services in accordance with the specifications as outlined in the ED-EN Hub project.

10. Evaluating the Adequacy of Selected Components, Features, and Factors (Step 4)

To evaluate the efficacy and "adequacy" of selected items for usage in the platform, a number of positive factors and specific features (selected from Table 6, that have potential application to the platform) were picked out and adapted to be evaluated. To evaluate and benchmark the adequacy and importance of the selected items, they are addressed in 100 questions, forming the adequacy questionnaire (see Table 3).

Each question in the questionnaire represents a potential item that might be used on the platform. The questions - based on the specifications and characteristics that they present- were classified under nine considered dimensions of collaboration namely, organisational, environmental, admission, behavioural, social, structural, functional, technological, and economical. This classification facilitates the presentation, analysis, and interpretation of the results of the evaluation.

The adequacy and importance of the selected items (to be considered for the platform) are assessed by a checklist in the questionnaire. There are six possible answers in the checklist for each question namely, strongly disagree (SDA), disagree (DA), agree (A), strongly agree (SA), I don't know, and I'm not sure (now). The evaluators can choose one of these possible answers and they can also insert comments and feedback (if needed) about each addressed item in each question. It is noteworthy to mention that this questionnaire provides a form of global evaluation of the considered dimensions and their respective items.

The questionnaire was sent to each partner of the ED-EN Hub consortium, and they were asked to respond to the questions collaboratively (with their internally involved members who are experienced in this field of study and work). The questions in each questionnaire were answered via the collaboration and confluence of different minds rather than a single partner. This strategy helped reduce the number of questionnaires that were sent out, answered, and evaluated but also increased the accuracy and value of the given answers.

The main results of this step of evaluation (average of the popularity of adapted items for implementation on the platform) achieved from analysing the five received

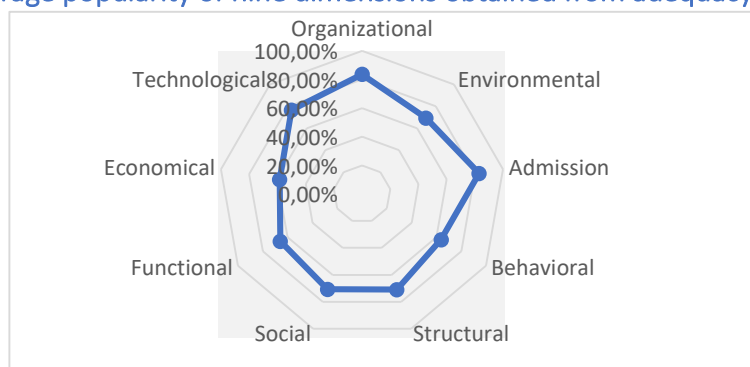
questionnaires are summarized in Table 5 and Figure 5. In the method for analysing the obtained data from respondents and calculating the statistical answers given to the questions (addressed in the questionnaire), a decision was made to give weight to each answer in the checklist. The attributed weights are as follows: (SDA = 1), (DA = 2), (A = 3), (SA = 4), (I don't know = 0), and (I'm not sure = 0). In the calculation, each answer (for a single question) was first multiplied with the attributed weight and then they were summed up and lastly divided by the total number of respondents. The received responses were analysed manually.

Table 5 — Average of popularity given to the dimensions in adequacy evaluation

Considered Dimensions	Number of questions per dimension	Average of popularity gained from adequacy evaluation
- Organizational	7	83.57%
- Environmental	7	69.28%
- Admission	12	82.91%
- Behavioral	8	63.75%
- Structural	15	71%
- Social	7	70.71%
- Functional	25	66%
- Economical	10	58.50%
- Technological	9	76.66%

To obtain an improved perspective of the results of this step of evaluation, they are also displayed as a radar chart in Figure 5.

Figure 5 Average popularity of nine dimensions obtained from adequacy evaluation.



Considering the given responses to the questions of the adequacy questionnaire (illustrated in Table 5 and Figure 5) and from the performed analysis, the following can be concluded:

- The nine considered dimensions are generally accepted by all evaluators (partners) because the average popularity given to all dimensions is above 50% (an indicator of acceptance).
- Among the considered dimensions, the organisational dimension and its respective items received the highest average of popularity (83.57%), whereas the economical dimension received the lowest average of popularity (58.50%) from the respondents' point of view.

- Analysing all responses given to every single question (in all dimensions) shows that some of the selected and adapted items (the average of their popularity is lower than 50%) need to be revised, improved, changed, or omitted (in some cases) before moving to the next phase of evaluations. In this direction, the provided feedback by the partners offered ideas of other points that needed to be addressed in further developments.

11. Evaluating the Adequacy of Functions (Step 4)

After evaluating the adequacy of the selected items, the defined functions for the platform were also evaluated (from the adequacy point of view) during some plenary meetings of the partners and stakeholders. This evaluation focused on judging whether or not the functions would adequately meet the objectives of the platform. At this step, the evaluation of the adequacy of the functions is performed at the conceptual level.

The results of evaluating the adequacy of defined functions are shown in Table 1 and Table 6. Considering the available information and focusing on theoretical and conceptual evaluation, the functions that show one or some signs and indications of adequacy for meeting one or some objectives of the platform are marked with (X) in Table 1 and Table 6. These tables address the eight defined functions and the five considered objectives for the platform. This step of evaluation also provides a view of the potential interactions among the platform's functions and objectives.

Table 6 — The results of evaluating the adequacy of the platform functions

ED-ENHUB Main Processes					
Platform Functions	Platform Objectives				
	Determine Skills Requirements	Co-Design, Develop, and Training	Detect, Assess, and Certify	Career Guidance	Organisational Benchmarking
F1. Search engine	x	x	x	x	x
F2. Collaboration	x	x	x	x	x
F3. Managing training		x			
F4. Training execution support		x (LMS)			
F5. Design curriculum	x	x			
6. Insertion of new competencies demands	x	x		x	
7. Tools to evaluate performance (benchmarking)			x	x	x
8. Database/service offering different tools	x	x	x	x	x

The results of function evaluation give direction to function creation, development, and implementation. These results are used as a base for function feasibility evaluations.

12. Evaluating the Feasibility of Selected Components, Features, and Factors (Step 5)

In this evaluation phase, the technical team from UNL's ED-EN Hub assessed the potential, capability, feasibility, and effectiveness of selected items for supporting the platform. They used a combination of knowledge-based inquiries and application-based techniques to gain valuable insights.

During this process, they not only examined whether the chosen items aligned with the available budget and technical capabilities but also identified, quantified, and reported any technical risks associated with their implementation. Evidence-based assessments and data-driven decision-making were prioritized.

Following this, the technical team delved deeper into evaluating various factors, features, and elements in accordance with the platform's functional requirements. They developed a second questionnaire to gather partner opinions on the team's judgments. This questionnaire, created using an online quiz maker like SurveyMonkey, comprised nine questions for each function, focusing on critical technical aspects. These questions were designed as polar questions (Yes or No) and can be found in Table 7.

The questionnaire was distributed to the same group of partners mentioned in the first round, with the intention of gathering their opinions and recommendations. Evaluators were encouraged to provide feedback as needed. In this round, 18 evaluators responded individually to the questions, as it was decided to incorporate both group and individual partner contributions at different stages of the evaluation process.

Table 7- Questionnaire used for evaluating the feasibility of selected components, features, and factors.

Questionnaire for evaluating the feasibility of considered dimensions of collaboration and their related items that have the potential to be implemented on the platform		
1. Questions for Search Engines for Finding Information and Tools	Y	N
1. It is feasible to be used for multiple purposes (e.g., searching, sorting info)		
2. It is feasible to have different access levels and provide a comprehensive list of available info		
3. It is feasible to be flexible to change (e.g., open to adding new info or keywords for searching)		
4. It is feasible to be free of charge and be used only by registered users		
5. It is feasible to have cross-functional capabilities (e.g., searching multiple features)		
6. It is feasible to be customizable (e.g., contains searching features to adapt to users' profiles)		
7. It is feasible to show newly inserted data in real time		
8. It is feasible to make income from external users using this service		
9. It is feasible to use advanced functions (e.g., search in other external hubs)		
2. Questions for Collaboration		
1. It is feasible to engage a diverse group of people in multiple communication tasks (e.g., chat forum)		
2. It is feasible to create collaboration spaces around different domains/topics		
3. It is feasible to promote the available skills or make a set of needed TRANSVERSAL COMPETENCES		
4. It is feasible to do limitless collaboration activities		
5. It is feasible to invite users to voluntarily contribute to collaborative activities based on their interest		

6. It is feasible to open the doors to society for engaging in collective problem solving		
7. It is feasible to support continuous collaborative activities to foment an active behaviour		
8. It is feasible to create income services (e.g., training-consultancy services)		
9. It is feasible to provide a built-in collaborative solution (e.g., zoom-could-based video communication; Proof Hub a task management app)		
3. Questions for Managing Training		
1. It is feasible to use different characteristics to manage the training planning (e.g., cost, success rate, learning needs)		
2. It is feasible to use different training modes (blended learning) in the training planning		
3. It is feasible to have a collective authoring training feature		
4. It should be able to consider inclusive training and learning		
5. It is feasible to give freedom for choosing the courses (help to prioritize learning needs based on the user's profile)		
6. It is feasible to use analytics over-collected info to improve further training authoring and planning (i.e., knowledge management)		
7. It is feasible to create a training plan such as evaluation of the contents collectively (have a procedure to perform)		
8. It is feasible to generate income by providing different services for external users		
9. It is feasible to have an external authoring tool (e.g., iSpring, Articulate)		
4. Questions for Training Execution Support		
1. It is feasible to define learning engagement strategies collaboratively		
2. It should be able to analyse what kind of approach or balance can be best used in training execution for different training modes (virtual vs. traditional classes)		
3. It is feasible to define the required training rules associated with execution modes		
4. It is feasible to define clear inclusive rules for admission		
5. It is feasible to manage the training execution with the trainees' competence level (have different learning engagement strategies according to each group of students' competencies)		
6. It is feasible to use analytics over-collected performance data to improve further training execution and its learning engagement strategies (i.e., knowledge management)		
7. It is feasible to support training execution, learning engagement strategies, and performance assessment definition		
8. It is feasible to generate income by providing training support services for external users		
9. It is feasible to provide a Learning Management System (e.g., Moodle)		
5. Questions for Design Curriculum		
1. It is feasible to create diverse group profile for contribution		
2. It is feasible to make open to all the processes of curriculum design		
3. It is feasible to design a curriculum based on the demands of companies		
4. It is feasible to provide free access (to design curriculum) to registered users		
5. It is feasible to develop volunteer and profile-based participation for designing the curriculum		
6. It is feasible to share training elements (e.g., learning strategies, processes, materials, and experiences) for a collaborative designing curriculum		
7. It is feasible to facilitate the process of continuous curriculum adaption		
8. It is feasible to generate income by providing this function (as a service) for external users		
9. It is feasible to trigger the external devices for notifying the deadlines of the particular contributions (e.g., calendar)		
6. Questions for Insertion of New TRANSVERSAL COMPETENCES Demands		
1. It is feasible to use diverse groups in finding competence demands collaboratively		
2. It is feasible to open to all the insertion of new competency demands		
3. It is feasible to suggest concepts for competence demand writing		
4. It is feasible to create an easy invitation procedure for the contribution of new companies		
5. It is feasible to encourage volunteer and active participation in finding new competence demands		
6. It is feasible to facilitate open discussion about the new competence demands		
7. It is feasible to facilitate the function of continuous competence demands finding		
8. It is feasible to provide consultation service (to generate income) for finding the competence demands		
9. It is feasible to use tools such as questionnaires to support the finding of competence demands		
7. Questions for Tools to Evaluate Performance		
1. It is feasible to use diverse groups that collaboratively define the KPIs for each specific activity		
2. It is feasible to create different levels of evaluation		
3. It is feasible to authorize users for taking different roles in the evaluation process		
4. It is feasible to have easy and free access to verification of the evaluation results		
5. It is feasible to create different roles for the evaluation procedure (e.g., evaluators, users, programmers)		

6. It is feasible to facilitate the open discussion about the evaluation results or KPIs definition		
7. It is feasible to facilitate the process of KPIs definition and evaluation for each activity		
8. It is feasible to use a consultation service (to generate income) for KPIs definition and evaluation process		
9. It is feasible to use tools such as questionnaires to support the KPIs definition and evaluation process		

It should be noted that the results gained from the primary round of questionnaires (used for evaluating the adequacy of selected and adapted factors, features, and elements) were used in this step as a base for feasibility evaluation. That is, those addressed factors, features, and elements (in the questions) that received high popularity and their threshold is $\geq 80\%$, are selected for consideration, further evaluation, and probable implementation on the platform (see Table 8).

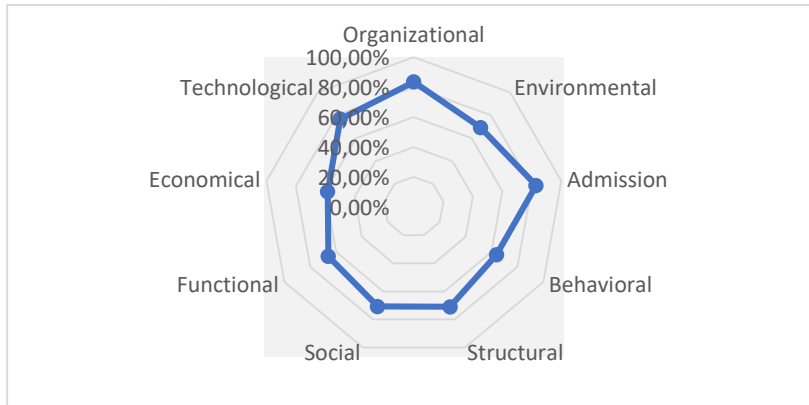
Table 8 summarizes the results of the adequacy evaluation (shown in Table 5), plus the number of questions (used in the questionnaire) per dimension, the number of questions per dimension whose threshold is ≥ 80 , and the selected items (after considering the threshold ≥ 80) that will be used as a base for feasibility evaluation. A threshold of 80 was specifically suggested for the selection of potential items as it could create a balance between the number of factors, features, and elements addressed in the questionnaire and the sum of items needed for feasibility evaluation in the next stage. In other words, in the adequacy evaluation (step 4), 100 factors, features, and elements were addressed in the questionnaire (one item per question). The number of addressed items for application to the EDENCP is relatively high, aiming to provide a reasonable number of potential items for selection and also providing a chance for the evaluators to select the items from the list that are the best from their perspective. This is because, from a feasibility point of view, it is not cost-effective to implement all those items in the EDENCP. It is note-taking that the considered threshold (≥ 80 , which is relatively high) caused a significant reduction in the number of considered items. This level of threshold and high percentages of popularity, however, give a certain degree of assurance for feasibility consideration.

Table 8- Results of adequacy evaluation and considered threshold that were used for feasibility evaluation

Considered dimensions	Results of adequacy evaluation	Number of questions per dimension	Number of questions per dimension that their threshold is ≥ 80	Base for consideration in feasibility evaluation
- Organizational	83.57%	7	5	71.42%
- Environmental	69.28%	7	3	42.85%
- Admission	82.91%	12	9	75%
- Behavioral	63.75%	8	3	37.50%
- Structural	71%	15	7	46.66%
- Social	70.71%	7	4	57.14%
- Functional	66%	25	7	28%
- Economical	58.50%	10	2	20%
- Technological	76.66%	9	6	66.66%

The graph illustrated in Figure 6 provides an improved perspective of the results presented in Table 10 (after consideration of the threshold).

Figure 6 — Results of adequacy evaluation and considered threshold that were used for feasibility evaluation



Within the considered threshold and the gained results, the following should be highlighted:

- The dimension of admission has the highest percentage of popularity at (75%), followed by the organizational dimension with (71.42%). However, the lowest percentage of popularity (given by the evaluators) belongs to the economical dimension (20%).
- The low percentage of the popularity of some dimensions (in both situations, before and after considering the threshold) namely, economical, functional, and behavioural shows that these dimensions did not receive high attention (in comparison with other considered dimensions) from the evaluators' point of view.
- Those dimensions that gained higher percentages of popularity namely, admission, organizational, and technological, indicate that they have a high potential of feasibility (from the evaluators' perspective) to be implemented on the platform.

Thus, the focus of attention should be given to these dimensions.

The feasibility questionnaire results, shown in Table 9, highlighted items with over 60% popularity (highlighted in green) for consideration in the next evaluation phase (effectiveness). The 60% threshold was recommended by partners and stakeholders to streamline the number of items for evaluation, ensuring a manageable selection of potential and feasible items for integration into the platform. This step aimed to refine and optimize the item pool.

Table 9 — Results of the second step of feasibility evaluation

Functions	Average of Popularity of Functions	Organizational	Environmental	Admission	Behavioral	Structural	Social	Functional	Economical	Technological
F 1	55.55%	83.33%	55.56%	66.67%	50.00%	66.67%	66.67%	33.33%	16.67%	61.11%
F2	53.08%	72.22%	83.33%	66.67%	11.11%	72.22%	44.44%	44.44%	33.33%	50.00%
F 3	50.61%	72.22%	94.44%	22.22%	66.67%	61.11%	38.89%	72.22%	11.11%	16.67%
F 4	52.46%	50.00%	83.33%	50.00%	66.67%	50.00%	61.11%	55.56%	11.11%	44.44%
F 5	53.70%	72.22%	38.89%	83.33%	55.56%	38.89%	100.00%	61.11%	5.56%	27.78%
F 6	52.46%	50.00%	61.11%	50.00%	83.33%	61.11%	61.11%	38.89%	22.22%	44.44%
F 7	51.85%	55.56%	61.11%	61.11%	66.67%	61.11%	44.44%	55.56%	16.67%	44.44%
Av	52.81%	65.07%	68.25%	57.14%	57.14%	58.73%	59.52%	50.58%	16.66%	41.26%

The results shown in Table 9 suggest that the following should be considered:

- The low average of popularity given to the economical dimension (16%) and technological dimension (41%) shows that the majority of addressed items in these two dimensions do not have much chance to be implemented in the platform from the feasibility point of view.
- The selected items should be prioritized in the process of implementation on the platform. That is, those that received a higher percentage of popularity (e.g., factors, features, and elements in the social dimension used for function 5, with 100%) need to be given more attention and emphasis.
- The dimensions also should be prioritized in the process of implementation in the platform. For example, among the addressed dimensions, the environmental dimension received a higher percentage of popularity (68%). In this manner, developers and decision-makers can manage the resources for implementation according to dimensions' feasibility and popularity.

13. Evaluating the Feasibility of Functions (Step 5)

According to the decision of partners and stakeholders, the evaluation of the feasibility of defined functions led to developing (collaboratively) their description. In addition, further function evaluation caused a merging of the first function (search engine) with the last function (database/service offering different tools). The first function is eventually changed to "search engine for finding information and tools". Therefore, the number of functions was reduced to seven. Following the collective evaluation of the defined seven functions, their definition is developed as presented below:

1. Search engine for finding available information and tools on the platform related to particular competencies (of members), courses, activities, and supporting tools
2. Collaboration whereby some members work together to complete a task, solve a problem, and/or achieve a shared goal.

3. Managing training, focused on flexible strategies to manage different aspects of training from programme creation to evaluation and prioritising learning needs.
4. Training support for (a) training implementation, (b) learning engagement strategies, and (c) implementation of performance-based assessment for training proficiency.
5. Designing curricula to create a training framework that is able to facilitate and guide the creation of training programmes. It integrates different training elements such as learning strategies, processes, materials, and experiences that may help design and develop such training program instructions.
6. Insertion of new competencies is the process of identifying and adding the key competencies and basic skills (e.g., cognitive skills of critical thinking, problem-solving, and interpersonal skills) required to perform teaching and training with success. This function supports the identification of competencies that are highly demanding for companies. It is designed for three main situations: (a) When an employer recognises that his company needs new workers, but the new workers only arrived from the university and do not have the specifically needed competencies; (b) When the employer recognises that the existing workers need to improve their competencies or gain new ones for the specific tasks; or (c) when the worker recognises (by that they need to gain some particular competencies. The main consequences of this function are to improve the existing curricula or add new ones based on the demands of the companies.
7. Tools to benchmark and evaluate the performances of (a) The platform in relation to its functions, and (b) The workers of the enterprises against the Transversal Competencies that they have already gained. To do so, it first needs a definition of some specific key performance indicators (KPIs) related to each performance.

14. Evaluating the Effectiveness of Selected Factors, Features, and Elements (Step 6)

In this step of evaluation, the technical team proceeded to assess the "effectiveness" of the selected items, aiming to judge the degree of their success in achieving the objectives of the platform (mentioned in Table 1 and Table 6). This task is concerned with comparing (at this stage theoretically) the inputs considered for the platform with the desired outputs that it can deliver. Therefore, to find out whether or not the selected items are effective in obtaining the expected results, from the feasibility point of view, a third questionnaire was created. The evaluators/partners are asked to provide a rating for each question, showing how much the considered items are effective (from their perspective) in reaching the goals of the platform. As shown in Table 10, the considered rates include: not at all effective (rate 0), slightly effective (rate 1), moderately effective (rate 2), very effective (rate 3), and extremely effective (rate 4).

Table 10 — Questionnaire for evaluating the effectiveness of considered dimensions of collaboration and their related factors, features, and elements that have the potential to be implemented in the platform.

Questionnaire for evaluating the effectiveness of considered dimensions of collaboration and their related factors, features, and elements that have the potential to be implemented in the platform					
Questions	Rates				
A. Questions for Search Engines for Finding Information and Tools	0	1	2	3	4
1. It is effective to be used for multiple purposes (e.g., searching, sorting info)					
2. It is effective to be flexible to change (e.g., open to add latest info or keywords for searching)					
3. It is effective to have cross-functional capabilities (e.g., searching multiple features)					
4. It is effective to be customizable (e.g., contains searching features to adapt to users' profiles)					
5. It is effective to use advanced functions (e.g., search in other external hubs)					
B. Questions for Collaboration					
1. It is effective to engage a diverse group of people in multiple communication tasks (e.g., chat forum)					
2. It is effective to create collaboration spaces around different domains/topics					
3. It is effective to promote the available skills or make a set of needed TRANSVERSAL COMPETENCES					
4. It is effective to invite users to voluntarily contribute to collaborative activities based on their interest					
C. Questions for Managing Training					
1. It is effective to use distinct characteristics to manage the training planning (e.g., cost, success rate, learning needs)					
2. It is effective to use different training modes (blended learning) in the training planning					
3. It is effective to consider inclusive training and learning					
4. It is effective to give freedom to choose the courses (help to prioritize learning needs based on the user's profile)					
5. It is effective to create a training plan such as an evaluation of the contents collectively (have a procedure to perform)					
D. Questions for Training Execution Support					
1. It is effective to analyse what kind of approach or balance can be best used in training execution for different training modes (virtual vs. traditional classes)					
2. It is effective to define clear inclusive rules for admission					
3. It is effective to use analytics over-collected performance data to improve further training execution and its learning engagement strategies (i.e., knowledge management)					
E. Questions for Design Curriculum					
1. It is effective to create diverse group profiles for contribution					
2. It is effective to design a curriculum based on the demands of companies					
3. It is effective to share training elements (e.g., learning strategies, processes, materials, and experiences) for collaborative designing curriculum					
4. It is effective to facilitate the process of continuous curriculum adaption					
F. Questions for Insertion of New Competencies Demands					
1. It is effective to make open to all the insertion of new competencies demands					
2. It is effective to create an easy invitation procedure for the contribution of new companies					
3. It is effective to encourage volunteer and active participation in finding new competence demands					
4. It is effective in facilitating open discussion about the new competence demands					
G. Questions for Tools to Evaluate Performance					
1. It is effective in creating various levels of evaluation					
2. It is effective to authorize users for taking separate roles in the evaluation process					
3. It is effective to have easy and free access to verification of the evaluation results					

4. It is effective to create distinct roles for the evaluation procedure (e.g., evaluators, users, programmers)					
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Considering the results shown in Table 9, items with a popularity of over 60% were selected for effectiveness evaluation, meaning that the items were evaluated at this time from an effectiveness perspective. In this step, the evaluators (partners and stakeholders), by giving a rate to each item, attempted to determine how much the addressed items are effective in the utilization and implementation of the platform. Table 11 presents the results of this step of evaluation from five received questionnaires.

Table 11 — Results of evaluating the effectiveness of selected factors, features, and elements.

Functions	Organizational	Environmental	Admission	Behavioral	Structural	Social	Functional	Economical	Technological
F1. Search engine	95%		90%		95%	80%			75%
F2. Collaboration	90%	95%	75%		90%				
F3. Managing training	95%	95%		80%	75%		90%		
F4. Training execution support		90%		80%		80%			
F5. Design curriculum	80%		95%			95%	75%		
F6. TRANSVERSAL COMPETENCES demands		80%		90%	80%	75%			
F7. Evaluate performance		75%	80%	90%	80%				
Sum	90%	87%	85%	85%	84%	82.5%	82.5%		75%

As shown in Table 11, except for the economical dimension (which reflected low average popularity in the previous step of evaluation, so the economical dimension was not considered in this step), the other dimensions have at least one item for effectiveness evaluation. From the results of this evaluation, the following was concluded:

- Generally, the results of this step of the evaluation show how effective the dimensions are. Among the addressed dimensions, the organizational dimension obtained the highest average popularity (90%), whereas the technological dimension received the lowest average popularity (75%).
- Those dimensions and their related items with a percentage of popularity (gained from this evaluation) lower than 80% (the considered threshold for this step) are not regarded as sufficiently effective items to be implemented in the platform. This means that the items with a percentage of popularity at 75 (highlighted with the yellow colour in Table 11) were all taken out from the list of considerations.
- In function implementation (step 7), dimensions that have a higher percentage of popularity should be prioritized. For example, in the implementation of function 1, priority (based on available resources and capabilities) should be given to organizational (95%) and structural (95%), admission (90%), and social (80%) dimensions.

15. Evaluating the Effectiveness of Functions (Step 6)

In the online and face-to-face plenary meetings that the partners had together, they held discussions and arguments about the effectiveness of the platform's functions. In these meetings, they shared their views and opinions on the following related questions:

- Can the functions achieve the desired/targeted goals?
- Can the functions gain a certain degree of success?
- Can the functions produce the desired effect?
- Can the functions be operated according to the project plan?

By critically assessing various aspects of functions' effectiveness, the partners finally concluded that the existing evidence shows the effectiveness of the functions.

It should be added that in the specification phase (steps 1–6), some strategies were taken into consideration, namely, clarifying the evaluation process, engaging the partners at different stages of evaluation, collaboratively designing the process of evaluation, developing the questionnaires, gathering credible evidence, justifying the conclusions, and using and sharing lessons learned. The next step presents the implementation phase.

16. Adjusting the Selected Factors, Features, and Elements (Step 7)

An adjustment transaction is a process that modifies item values that are no longer directly changeable once selected. This adjustment aims to refine and enhance selected items, making them more accurate, efficient, and suitable for implementation. These selected items play a crucial role in shaping a platform with tailored features, such as optimized search, seamless mobile navigation, unlimited file storage, and promotional capabilities. These enhancements, combined with developed functions, form the foundation of platform services for end-users, ensuring a user-friendly and feature-rich experience.

17. Implementing the Functions (Step 7)

The seven defined functions provide different services for different users at three main levels as mentioned below:


Individual/student level - provides services such as job seeking, internal and external mobility, certification, guidance, reconnection to the market, self-assessment, and social recognition.

Company/enterprise level - delivers services such as job and skill planning, internal mobility, recruitment, planning internships, sharing the vision with training and education actors, co-training, and developing partnerships.

Educational institutes level - provides services such as planning internships, finding required skills, meeting societal and employment actual and future needs, sharing the vision with companies, co-training, and developing partnerships.

Figure 7 provides a snapshot of the platform environment. It demonstrates that the platform is designed to deliver diverse services to three types of users.

Figure 7 Platform environment is customised for different services and three types of users.



A single integrated platform for "TTC" learning and compliance





Organizations today are taking a strategic, disciplined, enterprise-wide approach to creating and measuring learning and development initiatives. But managing your organization's internal learning can be daunting. It takes time and resources to create and schedule classes, manage invites and evaluations, issue certificates, and more.

USEFUL LINKS

- Sign in as an **Individual**
- Sign in as **Institutions**
- Sign in as a **Professional**

users

Main benefits for you:

-  Starter Learner
-  Practitioner Learner
-  Manager Learner
-  Educator 7-17

18. Evaluating the Appropriateness of the Proposed Evaluation Process

In this project, the evaluation process (shown in Figure 4) was used to support and guide the creation, operation, and implementation of the platform (EDENCP). To assess the appropriateness of the evaluation process, the following steps are performed:

1. Determining the objectives of the platform validation
2. Determining the needed tools for evaluation
3. Determining the suitable criteria and parameters for assessment of evaluation process appropriateness
4. Developing related survey questionnaires,

5. Identifying the potential evaluators, partners, and stakeholders
6. Preparing and conducting required interviews with evaluators
7. Performing evaluation tests
8. Analysing the collected feedback
9. Reporting the results of the assessment

The developed questionnaire for this purpose, which is presented in Table 12, contains 11 questions, addressing the considered validation criteria and parameters mentioned above.

Table 12— Questionnaire used for assessing the validation and appropriateness of the evaluation process.

Criteria / Parameters	Questions	SDA	DA	A	SA	IDK	IANS
Completeness	1. The MGF-MCL encompasses the necessary parts for the proper evaluation of the identified components, features, and factors that might be used in the creation, development, and implementation of EDENCP.						
	2. The MGF-MCL comprises the necessary steps for the proper evaluation of the considered functions of EDENCP.						
Purposefulness	3. The MGF-MCL can provide satisfactory results.						
	4. The MGF-MCL can create the expected value.						
Perceived usefulness	5. The MGF-MCL is useful for evaluating the identified components, features, and factors that might be used in (creation, development, and implementation) of EDENCP.						
	6. The MGF-MCL is useful for evaluating the considered functions of EDENCP.						
Perceived ease of use	7. The MGF-MCL is clear and easy to understand.						
	8. The MGF-MCL is clear and easy to follow.						
Cost-effective	9. The MGF-MCL helps us to save resources (e.g., time, effort, and costs) in identifying the required features and capabilities for EDENCP.						
Reasonability	10. The MGF-MCL can meet the expectations in identifying the required features that might be used in the creation, development, and implementation of EDENCP.						
	11. The MGF-MCL has a reasonable chance of success in the evaluation of the considered functions of EDENCP.						

The validation criteria and parameters are set by the technical team with respect to the proposed criteria and parameters in the literature, the strategic objectives of the project, and the expectations from the platform. The questionnaire contains six criteria and parameters and 11 questions. Each question should be rated on a 6-point Likert scale (Likert, 1932) including strongly disagree (SDA), disagree (DA), agree (A),

strongly agree (SA), I do not know (IDK), and I am not sure (IANS). The Likert scale questions are formulated to understand the level of agreement of respondents with the appropriateness of the evaluation process. The questionnaire was sent to eight groups of focused partners, and they were asked to respond to the questions with the collaboration of their internal team members who contribute to the project. The results of analysing their answers/opinions are presented in Table 13. It should be added that this questionnaire was made and analysed by "Survey-Monkey".

Table 13- Results of assessing the validation and appropriateness of the evaluation process.

Criteria / Parameters	Feedback Number	Questions	Weighted average	Percentages	SDA	DA	A	SA	IANS	IDK
Completeness	8	Q1	3	75%	0	0	3	3	1	1
	8	Q2	3	75%	0	0	3	3	1	1
Purposefulness	8	Q3	3.25	81.25%	0	1	4	3	0	0
	8	Q4	2.75	68.75%	0	1	4	2	1	0
Perceived usefulness	8	Q5	3.28	82%	0	0	5	3	0	0
	8	Q6	3.13	78.25%	0	1	5	2	0	0
Perceived ease of use	8	Q7	2.38	59.50%	0	1	3	2	2	0
	8	Q8	2.25	56.25%	0	1	4	1	2	0
Cost-effective	8	Q9	2.50	62.50%	0	2	1	2	1	2
Reasonability	8	Q10	3.14	78.50%	0	0	3	4	1	0
	8	Q11	3	75%	0	0	4	3	1	0
Average	-	-	2.88	72%	0	7	39	28	10	4
Max	-	-	4.00	100	55	55	55	55	55	55

Taking Table 13 into account, it can be stated that:

- All the criteria and parameters for assessing the validation and appropriateness of the evaluation process obtained over 50% (average), which is a reasonable indicator of general acceptance.
- Among the 11 questions addressed in this survey questionnaire, only three questions that are related to the criteria "perceived ease of use" and "cost-effective" had a percentage between 56% to 63%. The other 8 questions had a percentage ≥ 68.75 . The average percentage given to all the criteria and parameters is also 72. This shows a convincing indicator of evaluation process compliance.
- The given answers/feedback show that there is no "strong disagreement" for the addressed points (criteria and parameters). In fact, there are only 7 "disagreements" in total, which is not high.
- There were 39 "agreements" and 28 "strong agreements" which was a positive response towards the addressed criteria and parameters and the validation and appropriateness of the evaluation process.
- In total, there are only ten answers which claim that "I am not sure", and four answers that said, "I don't know". Indeed, this rate is not high at all. Because the evaluation process is assessed theoretically and conceptually at this

stage, a percentage of disagreement, ambiguity, and uncertainty is understandable.

Given the results and positive feedback achieved through the aforementioned assessment, and after several rounds of discussion, in the end, the partners and stakeholders accepted the evaluation process as a valid and appropriate means to be used in the project for supporting and directing the creation, development, and implementation of the platform.

19. Platform Specification

Having completed the process of evaluation for the items and functions of the digital platform the consortium used the findings gained to design, develop, and implement the platform practically. This section explains the different parts, features, and capabilities of the platform.

19.1 Users and Members of the Platform

The platform is a tool to support the Transversal Competences to groups of users namely, individuals, institutions, and professionals of guidance (see Figure 14). These three groups are explained briefly as follows:

Individuals - who intend to develop their Transversal Competences. The main functions that the individuals can perform are:

- a) Self-competence assessment
- b) External Transversal Competence recognition or certification
- c) Transversal Competences improvement activities such as training courses, workshops, and materials
- d) Looking for job opportunities

Institutions – refers to enterprises, educational institutes, and/or organisations that may request, provide, and/or deliver the needed services (e.g., training) for developing Transversal Competences. The main specific functions that the institutions can perform are:

- a) Publishing job opportunities (or professionals seeking work) based on specific Transversal Competences
- b) Making personal Transversal Competences recognition or certification, and
- c) Collaboration with other institutes in performing tasks such as analysing training demands, and co-creation and participation as a supporter of Transversal Competences improvement activities and training programmes.

Professionals of guidance – refers to professional instructors who provide individual users with distinct types of support and guidance. They can find the right tools for a particular assessment, or the right way to make an analysis of learners' feedback. The main specific functions that the institutions can perform are:

- a) Defining guidance procedures and certifications of participation

- b) Defining general activities plus assessments for Transversal Competence improvement. It may include training courses, workshops, and materials.
- c) Analysing the performances (assessing the quality of training and activities through trainees' feedback).

Members – the platform provides administrative support to the users. The main duties and responsibilities of the administrative members typically include:

- Determine rules and long-term objectives for the platform and recommend enhancements to all content according to the guidelines
- Integrate new technology system into the platform and coordinate with web administrator
- Maintain status for all platform projects and assist in resolving any issues for new and existing channels and automate all processes
- Perform tests on all configuration and upgrade processes, achieve all IT objectives, and maintain knowledge of new technology for all portal environments,
- Maintain an efficient platform documentation system (e.g., for training materials, results of evaluations and assessments),
- Management of public information and other portal configurations,
- Analyse all system upgrades and applications, ensure compliance with all program requirements, design all solutions for the platform, and assist in resolving all production issues.
- Analysis of global ED-EN Hub activities performance
- Monitor and analyse all system metrics and maintain optimal performance for the platform.
- Coordinate with administrators and users to implement all operational activities and determine all web server configurations, and
- Manage and configure all custom platform applications, and
- Publish automatic services information.

20. Services and Actions

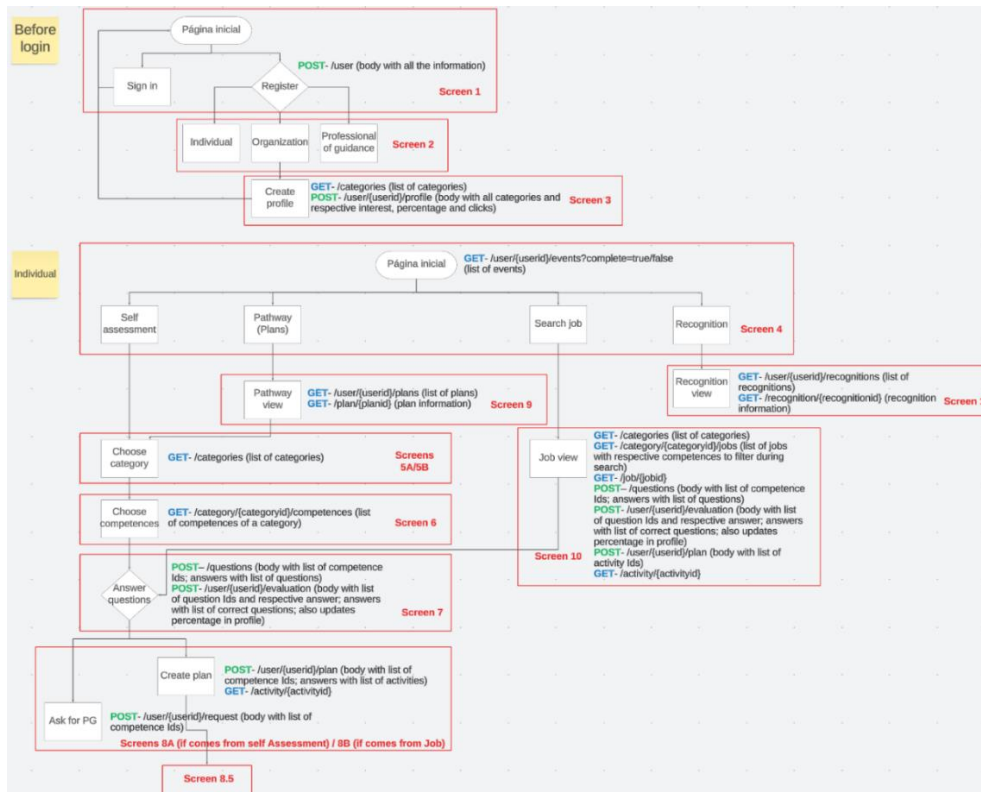
The services and actions of the platform present how a user can navigate the website, get the information they are seeking, and/or use the services they want. The ED-EN Hub platform offers a wide range of services for all users and members as presented in the following:

1. **Individuals** as main users of the platform/website can do the following eight actions: Create an account – refers to a personal space created for an individual user to interact with and access various features of the website. It typically involves the user registering with the website by providing certain personal information, such as their name, email address, and password. Once registered, the user can then log in to the website, use their credentials, and gain access to various features.

2. **Update the account** – refers to the process of making changes to a registered user's profile or personal information. This can include updating their email address, password, username, and other details associated with their account.
3. **Create a profile** – the profile page represents information regarding a user's identity on a website. It contains personal data, a profile photo, a summary, interests, achievements, and more.
4. **Self-assessment** – refers to the process of reflecting on and evaluating an individual's own TRANSVERSAL COMPETENCES and the areas for improvement which will be performed through a questionnaire provided.
5. **Search job** – involves using the website's search function to find the advertised job that matches his TRANSVERSAL COMPETENCES, skills, experience, and job preferences.
6. **Pathways** – refers to several types of activity programmes (e.g., courses, workshops, events) that individuals can take. Individuals can take and try various pathways simultaneously.
7. **Recognition** – refers to the acknowledgment of an individual's existence, validity, and competence development.
8. **Performance** – refers to accessing and checking the number of Transversal Competences that an individual user has taken.

Figure 8 visualises and clarifies the activities that individual users can perform over the platform.

Figure 8 — Screenshot of the activities that individual users can perform over the platform.



As shown in Figure 8, there are 11 screens that are explained briefly in the following: Screen 1 - shows the landing page with the option for signing in and registering the users.

Screen 2 - shows the three types of roles (Individual, institution, and Professional of Guidance) that users can take.

Screen 3 - shows the profile page that can be created by users.

Screen 4 - shows the four options (Self-Competences Assessment, Your Pathways, External Competences Recognition, and Looking for a Job) that the individual user can take to interact with the platform.

Screen 5 - shows the category of assessment of Transversal Competences that the individual user wants to take.

Screen 6 - shows the type(s) of Transversal Competences that the individual user wants to take from one or more groups of Transversal Competences.

Screen 7 - shows the self-assessment that the individual user should do by answering the related questions.

Screen 8 - screen 8A shows the pathway and plan that should be made by the individual user.

Screen 9 - shows all pathways that can be taken by the individual user

Screen 10 - shows the list of job opportunities advertised. There is a filter that allows individual users to refine and narrow down their search for job opportunities based on specific criteria. This function helps individual users find relevant job listings that Transversal Competence their preferences, qualifications, and more efficiently identify Transversal Register Competences.

Screen 11 - shows all the acknowledgment given (by the institutions and/or professionals of guidance) to the individual users based on their characteristics, achievements, qualities, and/or Transversal Competences. An individual user can receive multiple recognitions.

20.1 Institutions: Possible Actions

Institutions as main service providers can do the following 10 actions over the platform:

1. **Create an account** – to access various features of the website, the institutions also need to create an account and provide the needed information.
2. **Update the account** – the information associated with an institution's account can be updated, modified, and edited.
3. **Create a profile** – to share relevant information (e.g., personal, and professional information, marketing, and promotional purposes) on the portal.
4. **Give recognition** – refers to acknowledgment and appreciation of an institution's accomplishments, contributions, qualities, and Transversal Competences.
5. **Provide certification** – refers to providing official documentation for individual users that recognises and validates their achievement or completion of a specific task, course, program, activity, workshop, event, skill, or Transversal Competence
6. **Create activities** – refers to providing structured exercises or actions undertaken to enhance knowledge, develop skills and Transversal Competence, improve performance, or promote learning in a specific area or field.
7. **Create events** – refers to providing practices and programs designed to enhance the skills and Transversal Competence, knowledge, and capabilities of individual users in a specific subject or field. These events are typically structured and organized to provide structured learning experiences and opportunities for participants to acquire latest information, develop practical skills, Transversal Competence and improve performance.
8. **Create job opportunities** – refers to the process of providing, informing, and connecting individual users with potential employment options. It involves providing individual users with information about available job openings, internships, or other career-related opportunities that align with their interests, skills, Transversal Competence, and academic pursuits.
9. **Create collaboration** – refers to providing opportunities and involving various users and members, who come together to create and facilitate effective learning and development.
10. **Share plans** – refers to the process of distributing or sharing training plans or programs with other users and members. refer to the process of distributing or sharing training plans, programs, and strategic and systematic approaches designed to enhance and optimize the learning experience for users and

members. These plans outline the goals, objectives, strategies, and resources required to facilitate effective training and learning.

20.2 Guidance Professionals: Possible Actions

Professionals of careers and skills guidance as service providers and consulting groups can do the following four actions over the platform/website.

1. **Search requests** – refers to the act of looking for the messages sent from individual users, asking the professionals for guidance to perform a specific action or provide some information or services. Requests are a fundamental part of user-platform communication.
2. **Create custom made learning plans** – refers to designing a specific and tailored strategy, course of action, and/or guidance procedure to achieve a particular goal or objective. It involves considering the unique circumstances, resources, constraints, and requirements of a situation and developing a plan that aligns with those factors.
3. **Search collaboration** – refers to the process of working with other users and members to conduct research, gather information, and explore a specific topic or subject of interest. It also involves pooling resources, knowledge, and expertise to enhance the efficiency and effectiveness of the services provided.
4. **Create or share tools** – refers to the process of identifying, designing, and/or developing resources, materials, or software applications that facilitate the training of individual users in a specific area of knowledge or Transversal Competence. These tools are designed to enhance the learning experience and improve the effectiveness of training programmes.

20.3 Administrative Members: Possible Actions

Administrative members can do the following three actions over the platform:

1. **Activity check** – refers to the actions or tasks involved in the process of reviewing or verifying the quality of activities provided by institution users.
2. **Job check** – refers to the process of reviewing and checking the job sources, job advertisements, job goals, job descriptions, job needs, Transversal Competences.
3. **Event check** – refers to the process of reviewing and checking the event's types, lists, schedules, details, registration, access, quality, Transversal Competences.

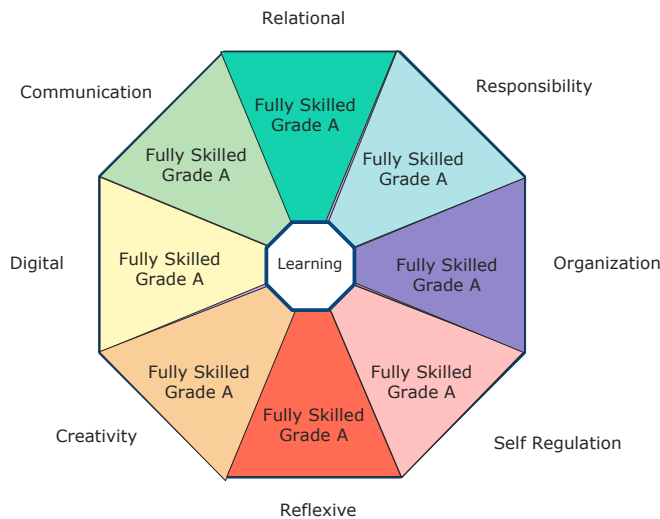
21. How the Transversal Competence Model works over the platform

The idea is to use the Transversal Competence Model (shown in Figure 3) as a 'Main Platform Engine Model' to identify, analyse, and compare the demanding Transversal Competence for enterprises. The following scenario clarifies this approach.

21.1 Example – A Scenario for Identifying, Analysing, and Determining the Demanding Transversal Competences

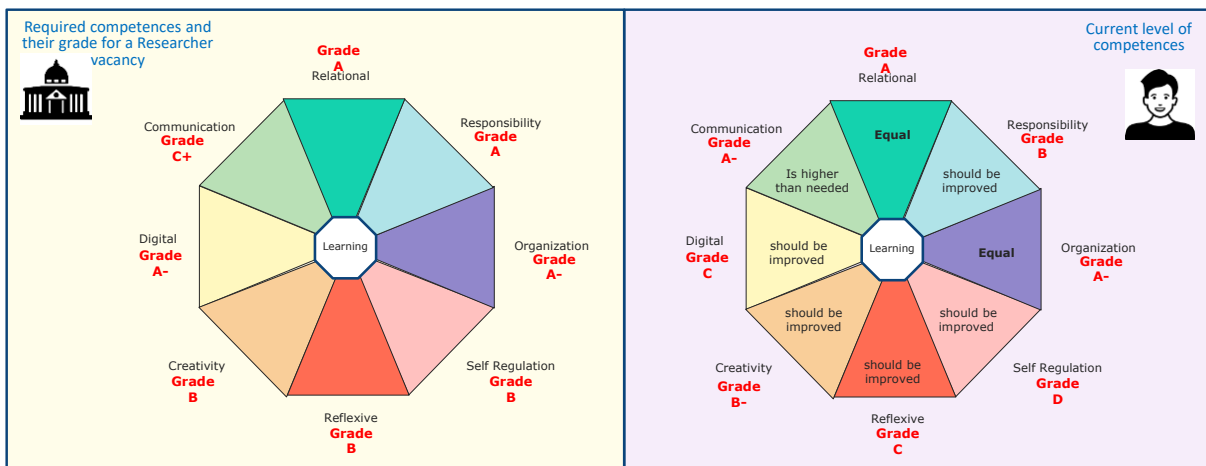
In presenting the scenario, we considered the Transversal Competence model as a reference model and an accepted source for analysing and comparing the demanding Transversal Competence. Figure 9 illustrates the Transversal Competence model we considered for a fully skilled person who has all the considered Transversal Competence in all nine groups of Transversal Competence (Relational, Responsibility, Organization, Self Regulation, Reflexive, Creativity, Digital, Communication, and Learning). This model is considered for assessing the scenarios. In this example the person has the full complement of Transversal Competences relevant to their level fo experience and development and learning journey.

Figure 9 — Transversal Competence model considered for a fully skilled person



In reality, a situation as shown in Figure 9 would be very unlikely to exist. Every job role has differing levels of required or desirable Transversal Competence and every person will have a unique and variable Transversal Competence profile. A more realistic model is presented in Figure 10.

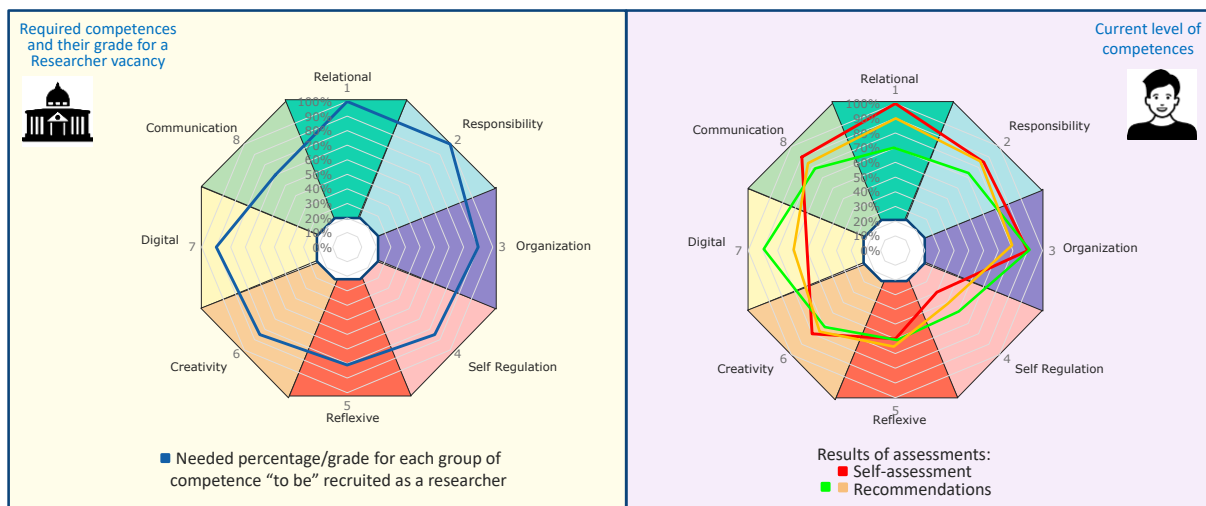
Figure 10— Transversal Competence model related to different job roles



On the left side of Figure 10, an enterprise makes a notification for a 'researcher vacancy'. The demanded Transversal Competences and the corresponding levels required for this position include Relational (grade A), Responsibility (grade A), Organization (grade A-), Sel Regulation (grade B), Reflexive (grade B), Creativity (grade B), Digital (grade A), and Communication (grade C+). Having received the notification or identified the job advertisement, an interested applicant would proceed with 'self-assessment' through a specific questionnaire provided or may receive a recommendation from institutions and/or guidance professional. The right side of Figure 10 shows the current level/grade of the person's Transversal Competences gained from their self-assessment. It shows that they have Relational (grade A), Responsibility (grade B), Organization (grade A-), Sel Regulation (grade D), Reflexive (grade C), Creativity (grade B), Digital (grade C), and Communication (grade A-). The self-assessment enables the applicant to identify their areas of strengths and those areas to develop further, which also directs them to create an action plan for improving Transversal Competences. Self-assessment is an efficient method for getting information. The results of self-assessment might not be an adequately reliable indicator. Some factors might affect the results negatively. For example, the individuals may not be familiar with the assessment process and criteria. Additionally, self-assessment can be subjective because individuals may not be sincere and may even over-evaluate their own performance. Therefore, to provide more judgments and (or reliable) indicators for the current Transversal Competences of the applicant, the assessment can be done by other users (institutions, or guidance professionals).

When the assessments are completed, the users (individuals, institutions, and guidance professionals), the target enterprise can analyse the results of the assessments. By way of illustration, the right side of Figure 11 demonstrates the results of three assessments that are made by the applicant (through self-assessment) and two other users (as recommendations).

Figure 11 — Transversal Competences required by role and by individual



The way of analysing and displaying the information and results of the assessment shown in Figures 10 and 11 is beneficial in understanding the relations between the required Transversal Competences and the results of assessments. Furthermore, these figures can communicate a lot of information in a single image, which can save time and effort compared to reading through lengthy texts. Overall, they can be used as a powerful tool for conveying information in a clear, concise, and effective manner.

The comparison between the required Transversal Competences with the results of the assessment(s) gives a clear vision of the gaps in Transversal Competences and directs both the enterprise and the individual to tools and resources to develop these through education and training opportunities.

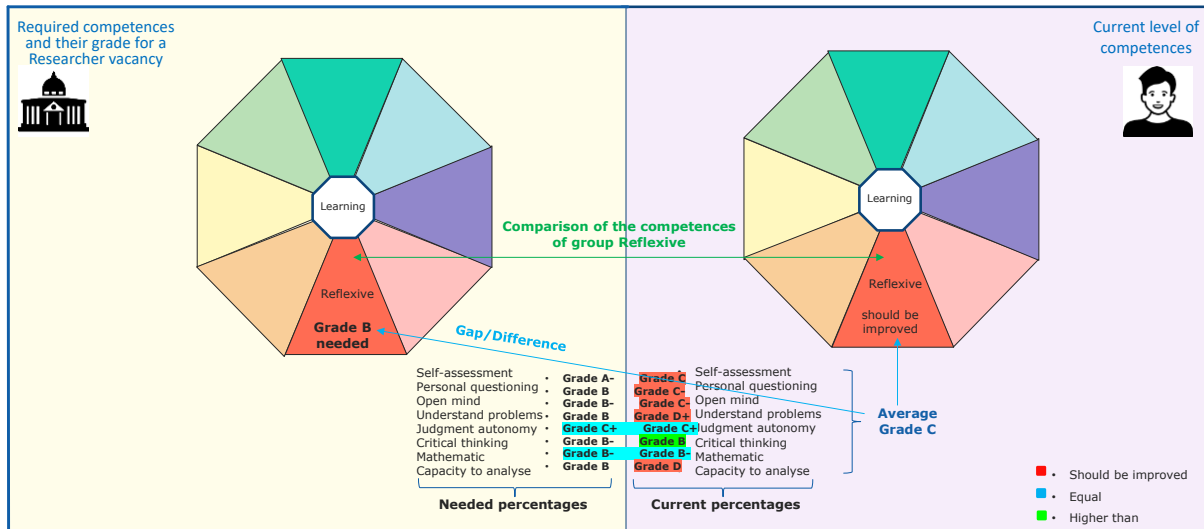
Figure 12 compares the required Transversal Competences (at the group level) with the results of the self-assessment. The blue figure represents the required Transversal Competences, and the red figure represents the results of the self-assessment. Given that, the gaps, or the group of Transversal Competences that the applicant needs to fill/develop include Responsibility, Self-Regulation, Reflexive, and Digital. The current Transversal Competences of the applicant / individual user can meet the required level for the Relational, Organisation, and Creativity groups. His communication Transversal Competences exceeds the requirements.

Figure 12 — Comparing the required Transversal Competences with the results of self-assessment.



The analysis and comparison could be deeper and appraise the required Transversal Competences of every single group of Transversal Competences. As an example, Figure 13 makes an analysis and comparison for the 'group of Reflexive' competences. The required Transversal Competences and grades from the Reflexive group include Self-assessment (grade A-), Personal questioning (grade B), Open mind (grade B-), Understanding problems (grade B), Judgment autonomy (grade C+), Critical thinking (grade B-), Mathematics (grade B-), and Capacity to analyse (grade B).

Figure 13 — Analysis and comparison of the group of Reflexive competences

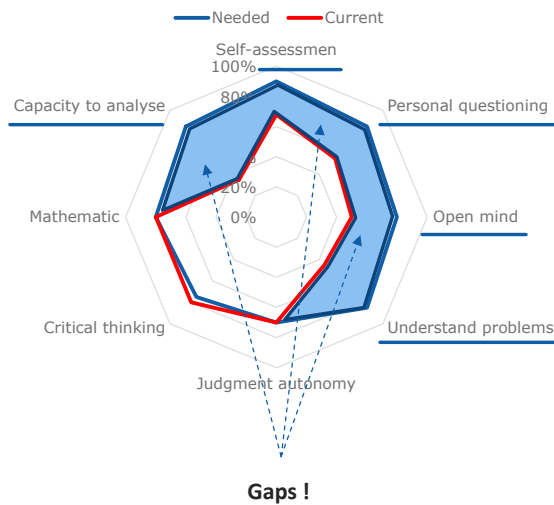


The current Transversal Competences and grades of the applicant for the Reflexive group are Self-assessment (grade C), Personal questioning (grade C-), Open mind (grade C-), Understanding problems (grade D+), Judgment autonomy (grade C+), Critical thinking (grade B), Mathematics (grade B-), and Capacity to analyse (grade D). The analysis and comparison show that five Transversal Competences should be developed namely, Self-assessment, Personal questioning, Open mind, Understanding problems, and Capacity to analyse which are highlighted in red colour in Figure 13. There are two Transversal Competences (Judgment autonomy and Mathematics) that have equal levels/grades which are highlighted in blue colour. The only competence that exceeds the requirement is Critical thinking which is highlighted in green colour.

Figure 14 gives a more detailed view of the analysis and comparison shown in Figure 13. The blue part is the gap in Transversal Competences that needs to be filled/developed.

Figure 14 — Gaps and Transversal Competences that need to be filled/developed in the group of Reflexive competences

Specific competences in the group of Reflexive



Having identified the gaps and the Transversal Competences that need development, the applicant should then refer to the 'guidance programs' to identify and select the associated activities that should be performed by him. There are a variety of activities designed and developed to support individual users in developing their skills and Transversal Competences. To find the relevant associated activities, the users can request a consultation from the institutions or guidance professional. Figure 15 shows some samples of associated activities that the applicant / individual users can perform to develop their Transversal Competences.

Figure 15 — Sample of associated activities to develop Transversal Competences

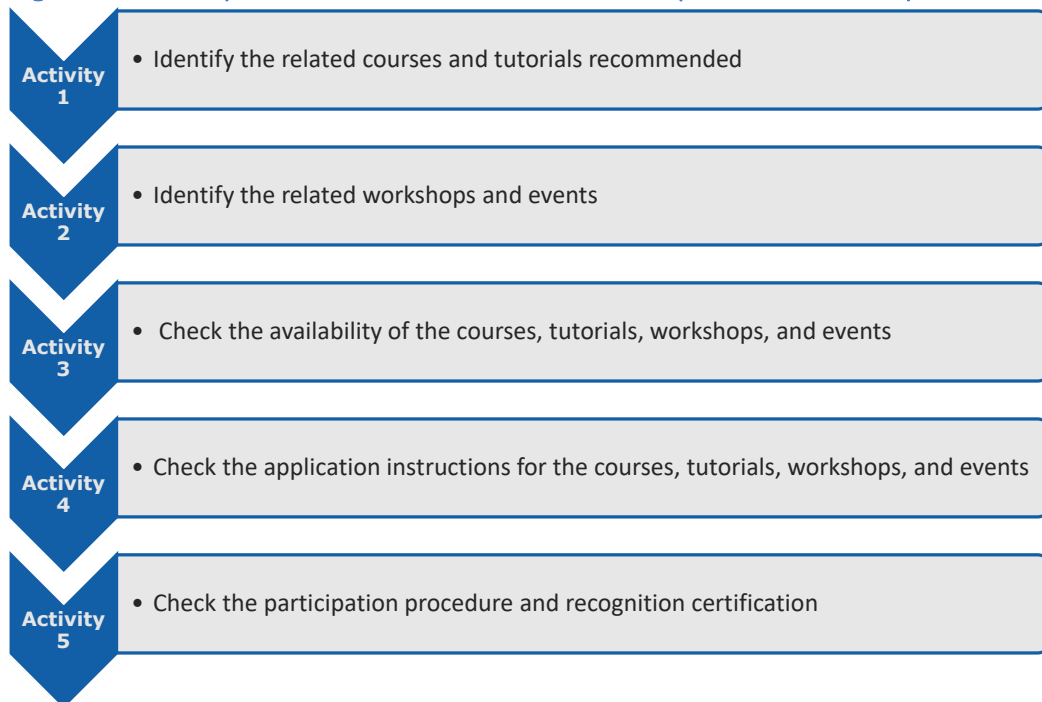
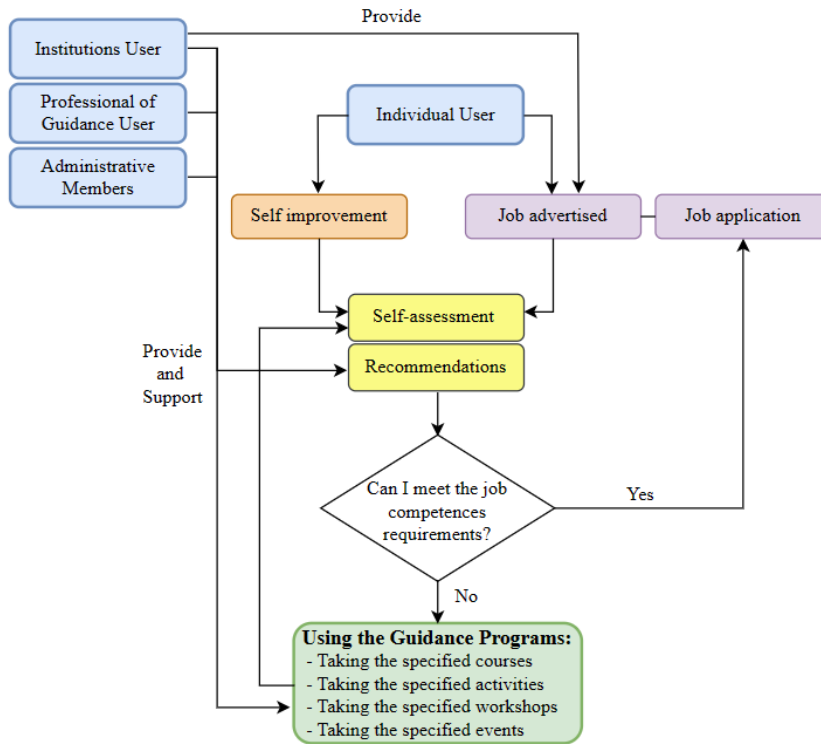


Figure 16 summarises the method which helps individual users to develop their Transversal Competences.

Figure 16- A methodology for developing individual users' Transversal Competences



For each competence one or more related activities are developed for the users to take. The nine categories of Transversal Competences (Relational, Responsibility, Organization, Self-Regulation, Reflexive, Creativity, Digital, Communication, and Learning) are listed on the right side of Table 14 and the related activities are placed right in front of the competences. Thus, Table 14 visualises the provided activities for developing Transversal Competences.

Table 15 — List of activities.

No		Activities	Abbreviations	No	Activities	Abbreviations
1		Activity to Career Smart Skills	ACSS_B	16	Activity to explore creative techniques and approaches	AECT_B
2		Activity to sort candidates based on their language skills	ACLS_I	17	Activity to Critical Thinking Exercise	ACTE_I
3		Activity to analyze work strengths	AAWS_B	18	Activity to Introduction to common digital tools	AIDT_B
4		Activity to exploring Numerical Reasoning	AENR_I	19	Activity to Strengthen observation and active listening skills	ASOL_E
5		Activity to delivering high quality business training	ADBT_B	20	Activity to Language and cultural immersion activity	ALCI_I
6		Activity to Skill Scan Express	ASE_E	21	Activity to Audio-Visual	AAV_B
7		Activity to speed up Future Skills Tracker	AFST_I	22	Activity to Develop Intercultural Awareness	ADIA_I
8		Activity to accelerate Skills Audit	AASA_B	23	Activity to evaluate ethical dilemmas in engineering	AEDE_E
9		Activity related to assess individuals' personality	AAIP_I	24	Activity to analyse and evaluate the types of knowledge	AAEK_I
10		Activity about Assurance of Learning techniques	AALT_B	25	Activity to Apply change management principles	AAMP_I
11		Activity to Understand the importance of lifelong learning	AULL_B	26	Activity to Develop effective communication	ADEC_I
12		Activity to Develop an awareness of economic considerations	AAE_I	27	Activity to Develop problem-solving	ADPS_B
13		Activity to Learn techniques for managing timelines	ALMT_E	28	Activity to Case studies and examples of successful digital marketing	ACSDM_E
14		Activity to test making decisions under uncertainty	ADU_I	29	Activity to improve personal Life Skills	AILS_I

15		Activity to Participants to gain the skills and knowledge	APSK_E	30	Activity to apply sustainable and ethical practices	ASEP_E
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22. Platform Demonstration

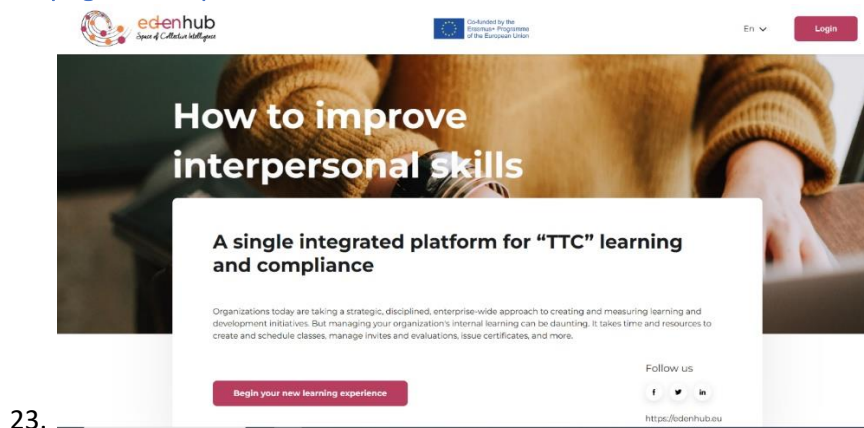
Having designed and developed the platform, the users can then access it and perform the related functions and activities. In the following examples, the access to the platform from individual users' points of view and administrative users' points of view are presented.

22.1 Access to the Platform from Individual Users' Points of View

Individual users can access the platform and perform their related functions and activities by taking the following steps:

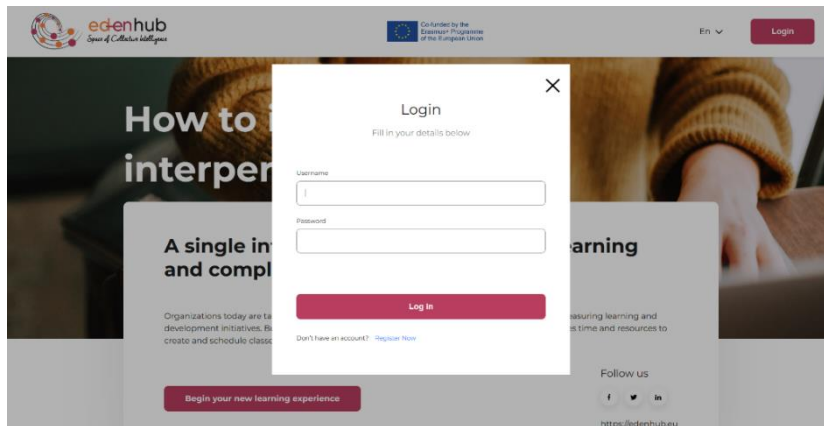
Step 1 (Using URL) – The easiest and fastest way to access the platform/website is to write its address (<https://uninovaedenhub.dev10.javali.pt/>) into the address bar located in the browser that the individual users use. This address is known as a Uniform Resource Locator (URL). The front page of the platform is shown in Figure 17.

Figure 17 — Front page of the platform



Step 2 (login) – Logging in is usually used to enter the platform. Once the user is logged in (by adding his/her username and password), he/she can access the platform. The login token may be used to track what actions the user has taken while connected to the platform. The logging page of the Platform is shown in Figure 18.

Figure 18 — Login page of the platform

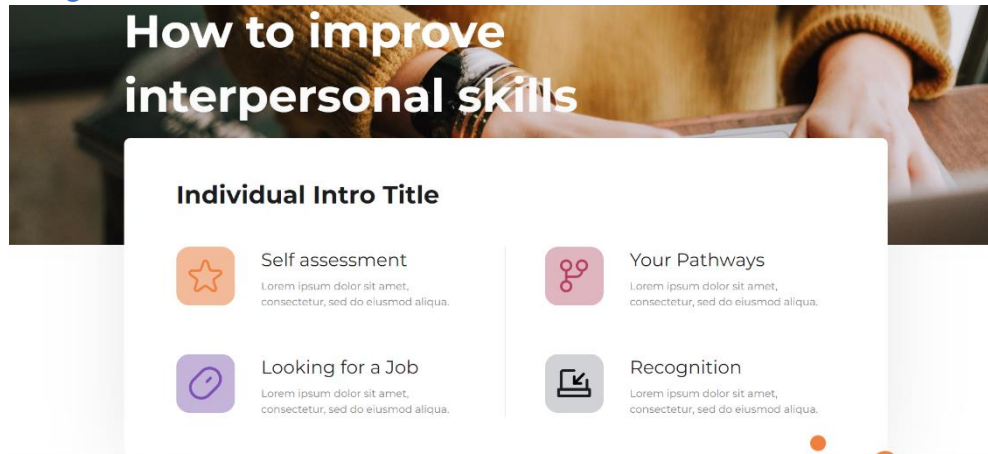


Step 3 (Creating a new account) – In this step, the platform is ready to create a new account. On a higher level, what the platform needs to do is store in the database the email and password of the user which will let him/her into his/her account. The page for creating a new account is shown in Figure 19.

Figure 19 — Page for creating a new account




Step 4 (Self-assessment) – In this step, the user can proceed with assessing their Transversal Competences. The self-assessment practice in the platform can help users reflect on their work or skills. The page for self-assessment is shown in Figure 20.

Figure 20 — Page for self-assessment



Step 5 (Choosing the category) – In this step, the user can choose one or some categories of the Transversal Competences that he/she wants to develop. As mentioned earlier and also shown in Figure 21 there are nine categories of Transversal Competences (Relational, Responsibility, Organisation, Self Regulation, Reflexive, Creativity, Digital, Communication, and Learning). Choosing the categories of Transversal Competences is directly related to the types of Transversal Competences that the target job requires. Therefore, it is important for users to choose the right categories. As depicted in Figure 21, in this example, the user has chosen the category of Reflexive.

Figure 21 — Page for choosing the Transversal Competences categories

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In which category do you want to self-assess yourself (Path: Self)

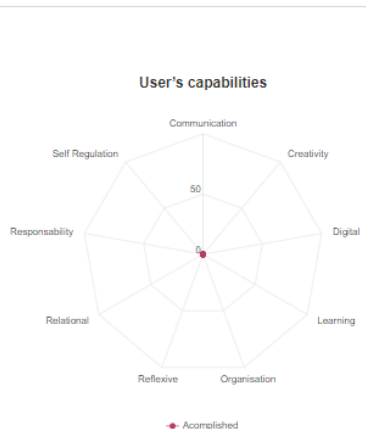
Note: The ones in orange were already assessed by you – you may redo them. This radar graph represents the assessment results made by you so far.

Choose the category

- Communication
- Creativity
- Digital
- Learning
- Organisation
- Reflexive
- Relational
- Responsibility
- Self Regulation

Back
Next




User's capabilities



+ Accomplished

Step 6 (Choosing the competence) – In this step, the user can choose the Transversal Competences related to the chosen category (Reflexive). As illustrated in Figure 22, the user chose the open mind/cognitive flexibility competence.

Figure 22 — Page for choosing the competences


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Please select the competences.

Choose the competences

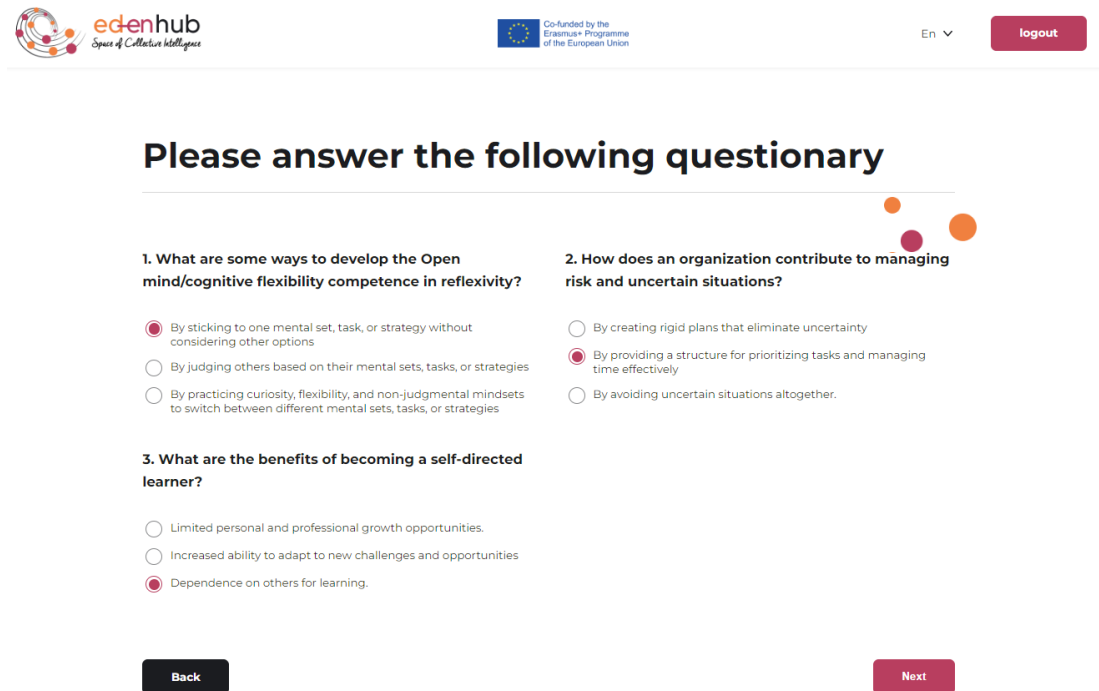
- Open mind/cognitive flexibility
- Stepping Back for Problem Diagnosis and Understanding
- Developing Competence in Data Analysis and Interpretation

Back
Next



Step 7 (Answering the questionnaire) - When the desired competences are chosen by the user, the platform will then suggest a questionnaire containing some related questions. The user has to answer the questions relying on his/her background knowledge and experience. In this step, the related knowledge and experience of the users will be gauged. Figure 23 shows the answers given by the users.

Figure 23 — Page for answering the questionnaire



The screenshot shows the top navigation bar with the edenhub logo, the European Union flag, and the text 'Co-funded by the Erasmus+ Programme of the European Union'. There is a language dropdown set to 'En' and a 'logout' button. The main heading is 'Please answer the following questionnaire'. Below this, there are three questions with radio button options:

1. What are some ways to develop the Open mind/cognitive flexibility competence in reflexivity?

- By sticking to one mental set, task, or strategy without considering other options
- By judging others based on their mental sets, tasks, or strategies
- By practicing curiosity, flexibility, and non-judgmental mindsets to switch between different mental sets, tasks, or strategies

2. How does an organization contribute to managing risk and uncertain situations?

- By creating rigid plans that eliminate uncertainty
- By providing a structure for prioritizing tasks and managing time effectively
- By avoiding uncertain situations altogether.

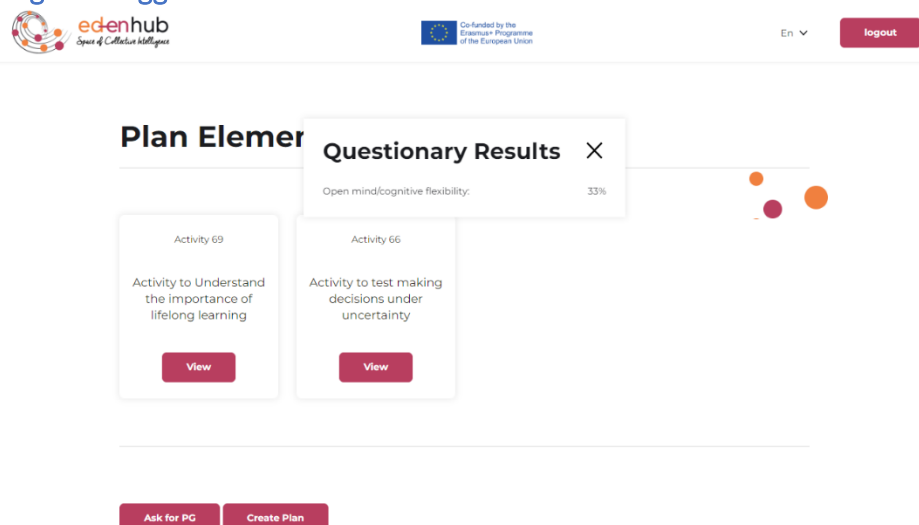
3. What are the benefits of becoming a self-directed learner?

- Limited personal and professional growth opportunities.
- Increased ability to adapt to new challenges and opportunities
- Dependence on others for learning.

At the bottom, there are 'Back' and 'Next' buttons.

Step 8 (Choosing activities) – In this step, the platform shows (a) the results of the questionnaire, and (b) the list of related activities that the user can take. As displayed in Figure 24, activity number 69 (activity to understand the importance of lifelong learning) is suggested to the user which is related to the competence of 'open mind/cognitive flexibility'.

Figure 24 — Page for suggested activities to be taken.



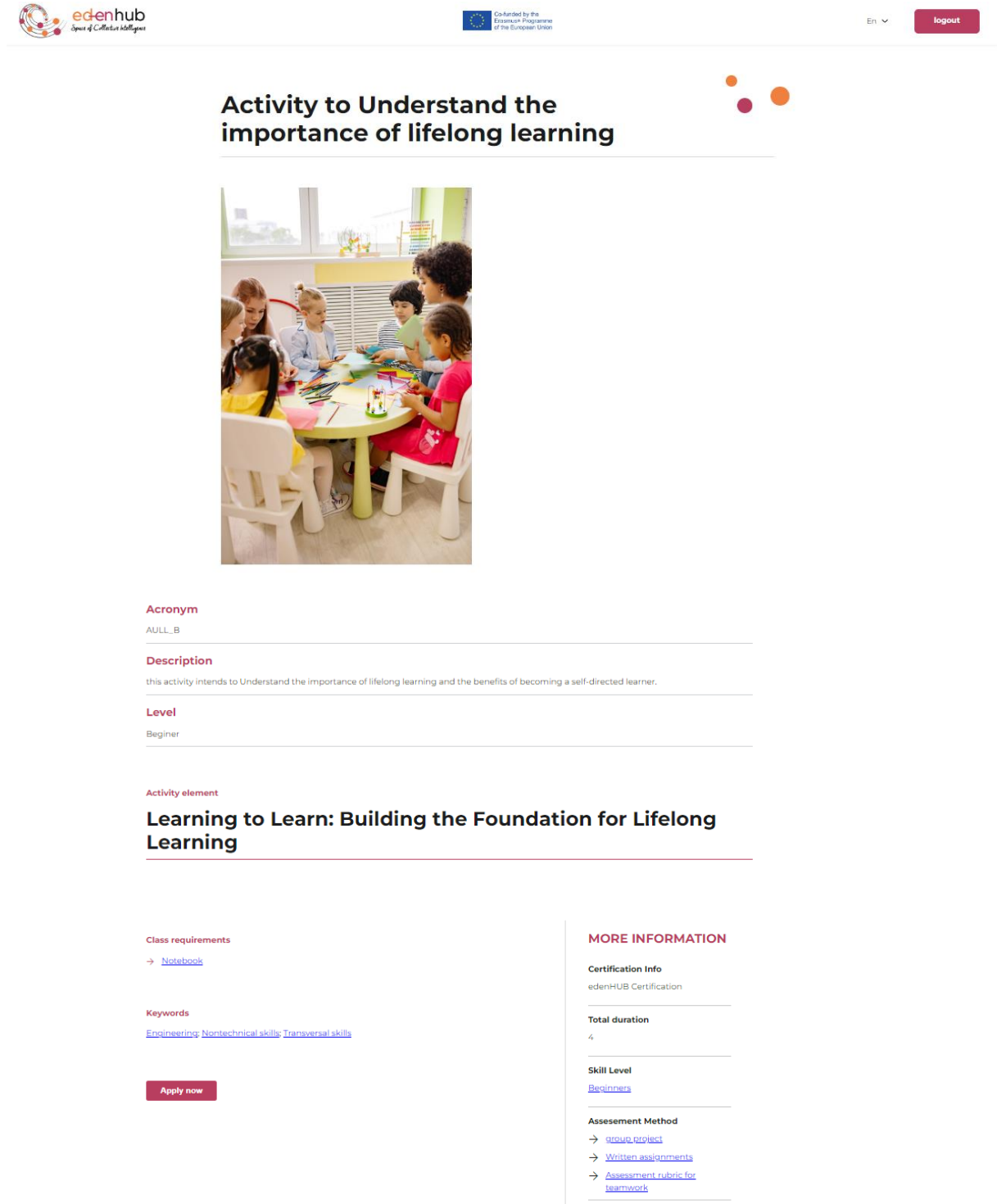
The screenshot shows the top navigation bar with the edenhub logo, the European Union flag, and the text 'Co-funded by the Erasmus+ Programme of the European Union'. There is a language dropdown set to 'En' and a 'logout' button. The main heading is 'Plan Elemer'. A 'Questionnaire Results' modal is open, showing 'Open mind/cognitive flexibility: 33%'. Below the modal, there are two activity cards:

- Activity 69:** Activity to Understand the importance of lifelong learning. View button.
- Activity 66:** Activity to test making decisions under uncertainty. View button.

At the bottom, there are 'Ask for PG' and 'Create Plan' buttons.

Step 9 (Viewing activities) – In this step, the user can open and view the suggested activity and then proceed with taking that. Figure 25 shows the view page of the activity to understand the importance of lifelong learning.

Figure 25 — Page for viewing the suggested activity



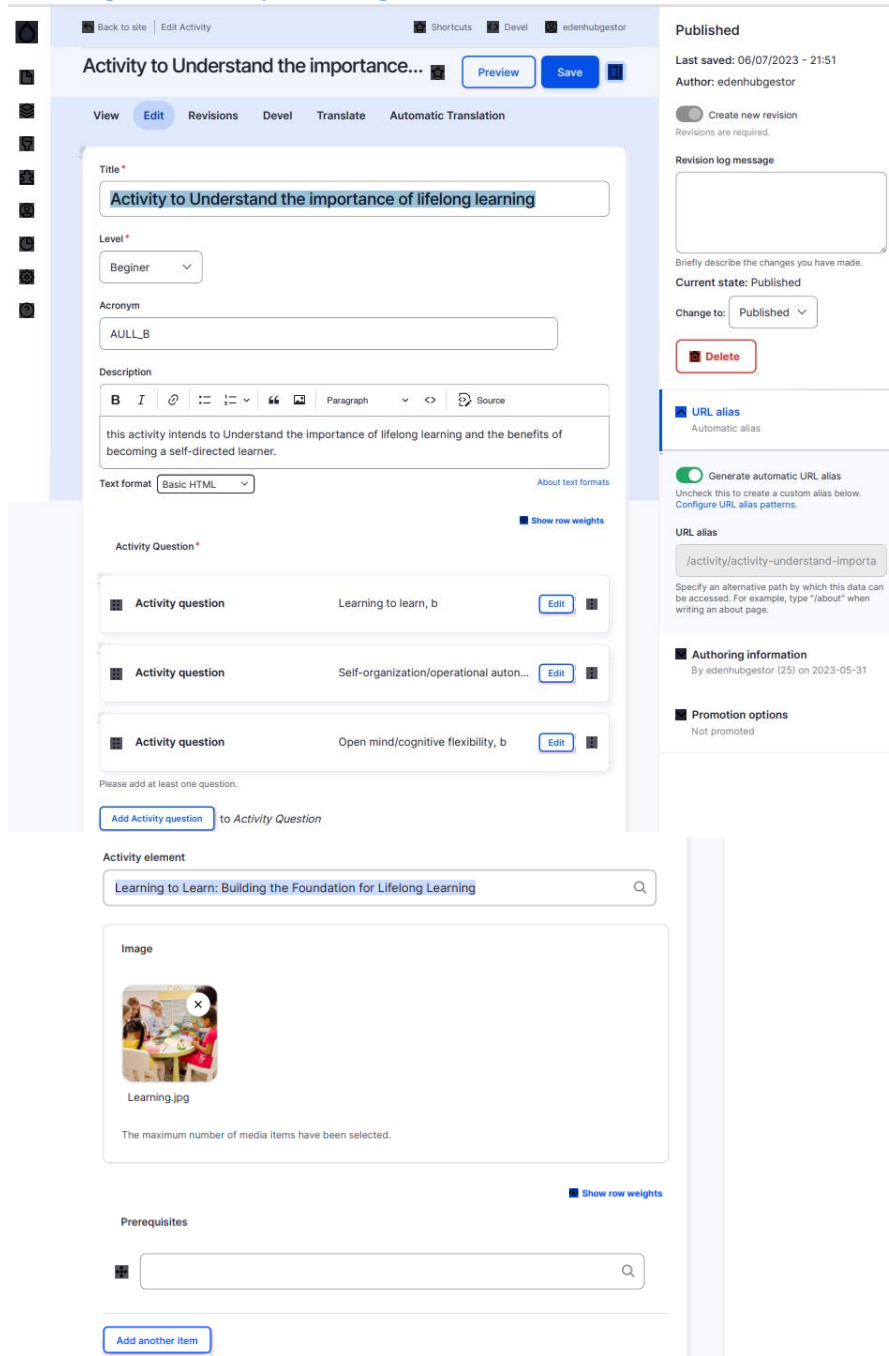
The screenshot shows the edenhub interface. At the top left is the edenhub logo. In the center, the title 'Activity to Understand the importance of lifelong learning' is displayed. Below the title is a photograph of a group of children sitting around a table, engaged in a learning activity. The page layout includes several sections: 'Acronym' (AULL_B), 'Description' (this activity intends to Understand the importance of lifelong learning and the benefits of becoming a self-directed learner.), 'Level' (Beginner), and 'Activity element' (Learning to Learn: Building the Foundation for Lifelong Learning). On the left side, there are 'Class requirements' (Notebook), 'Keywords' (Engineering: Nontechnical skills; Transversal skills), and an 'Apply now' button. On the right side, a 'MORE INFORMATION' section provides details on 'Certification Info' (edenHUB Certification), 'Total duration' (4), 'Skill Level' (Beginners), and 'Assesement Method' (group project, Written assignments, Assessment rubric for teamwork).

22.2 Access to the Platform from Administrative Users' Points of View

The following section presents some examples of the pages related to the functions and activities that the administrative users can access:

Example 1 (Page for activity checking) – As mentioned previously in step 8, when the activity is suggested by the platform, the administrator can access some related information such as the title (of the activity), level, acronym, description, activity question(s), activity element(s), and prerequisites. Figure 26 shows the related information to the activity of 'activity to understand the importance of lifelong learning' from an administrative point of view.

Figure 26 — Page for activity checking



Back to site | Edit Activity | Shortcuts | Devel | edenhubgestor

Activity to Understand the importance... | Preview | Save

View | Edit | Revisions | Devel | Translate | Automatic Translation

Title *
Activity to Understand the importance of lifelong learning

Level *
Beginner

Acronym
AULL_B

Description
this activity intends to Understand the importance of lifelong learning and the benefits of becoming a self-directed learner.

Text format: Basic HTML | About text formats

Activity Question *

Activity question	Learning to learn, b	Edit
Activity question	Self-organization/operational auton...	Edit
Activity question	Open mind/cognitive flexibility, b	Edit

Please add at least one question.
Add Activity question to Activity Question

Activity element
Learning to Learn: Building the Foundation for Lifelong Learning

Image
Learning.jpg
The maximum number of media items have been selected.

Prerequisites

Add another item

Published
Last saved: 06/07/2023 - 21:51
Author: edenhubgestor

Create new revision
Revisions are required.

Revision log message

Briefly describe the changes you have made.

Current state: Published
Change to: Published

Delete

URL alias
Automatic alias

Generate automatic URL alias
Uncheck this to create a custom alias below. Configure URL alias patterns.

URL alias
/activity/activity-understand-importa

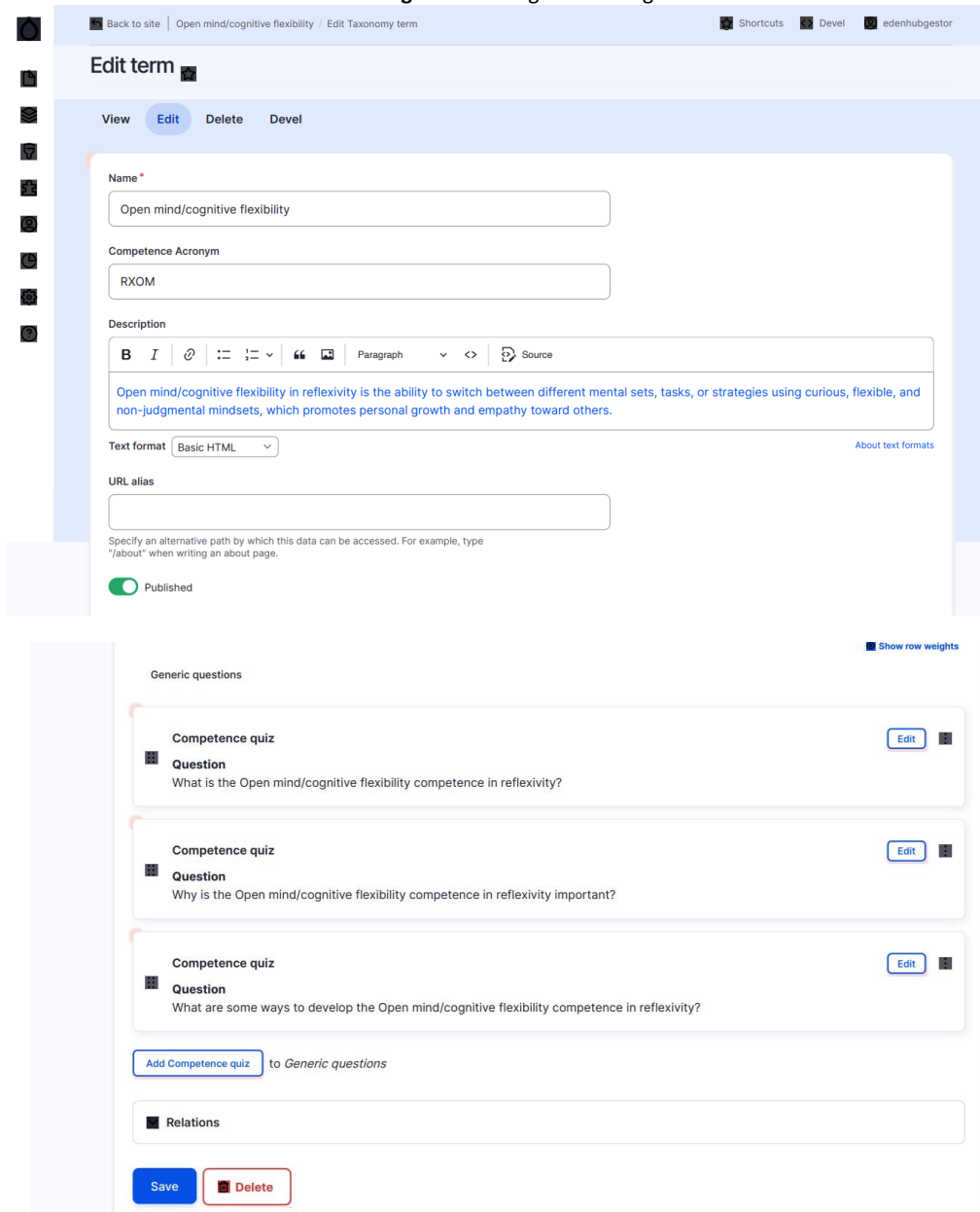
Specify an alternative path by which this data can be accessed. For example, type "/about" when writing an about page.

Authoring information
By edenhubgestor (25) on 2023-05-31

Promotion options
Not promoted

Example 2 (Page for editing terms) – In this page, the administrators can edit the information (e.g., name, competence acronym, description, URL alias, and generic questions) related to the competences. Figure 27 shows the information related to the competence 'Open mind/cognitive flexibility' that can be edited by the administrators.

26. **Figure 27** — Page for editing term.



Back to site | Open mind/cognitive flexibility / Edit Taxonomy term | Shortcuts | Devel | edenhubgestor

Edit term

View **Edit** Delete Devel








Name *

Open mind/cognitive flexibility


Competence Acronym

RXOM

Description

B *I*      Paragraph   Source

Open mind/cognitive flexibility in reflexivity is the ability to switch between different mental sets, tasks, or strategies using curious, flexible, and non-judgmental mindsets, which promotes personal growth and empathy toward others.

Text format Basic HTML  [About text formats](#)


URL alias

Specify an alternative path by which this data can be accessed. For example, type "/about" when writing an about page.


Published

[Show row weights](#)


Generic questions

Competence quiz [Edit](#) 

Question
What is the Open mind/cognitive flexibility competence in reflexivity?

Competence quiz [Edit](#) 

Question
Why is the Open mind/cognitive flexibility competence in reflexivity important?

Competence quiz [Edit](#) 

Question
What are some ways to develop the Open mind/cognitive flexibility competence in reflexivity?

[Add Competence quiz](#) to Generic questions

Relations

[Save](#) [Delete](#)

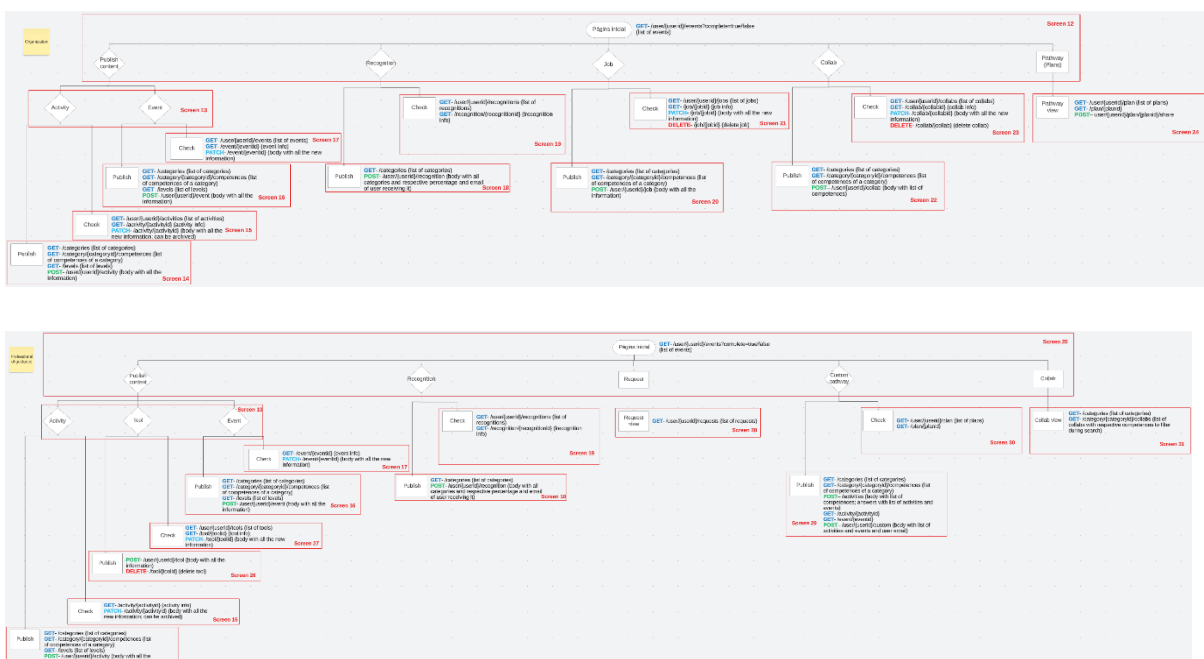
23. Conclusion

This collaborative platform is expected to be a facilitator for the collaboration between Education and Enterprises, as well as a tool for all the actors of orientation (individuals, education and orientation actors, institutions). It has been developed at the same time than ED-EN hub local hubs (See deliverable D2.0). The challenges posed by this mass collaboration are currently under study by researchers, both on a technical and on an organisational point of view (see Majid Zamiri's publication and PhDthesis listed in the Reference section). At the moment, only a beta version of the platform has been discussed and tried within the local hubs.

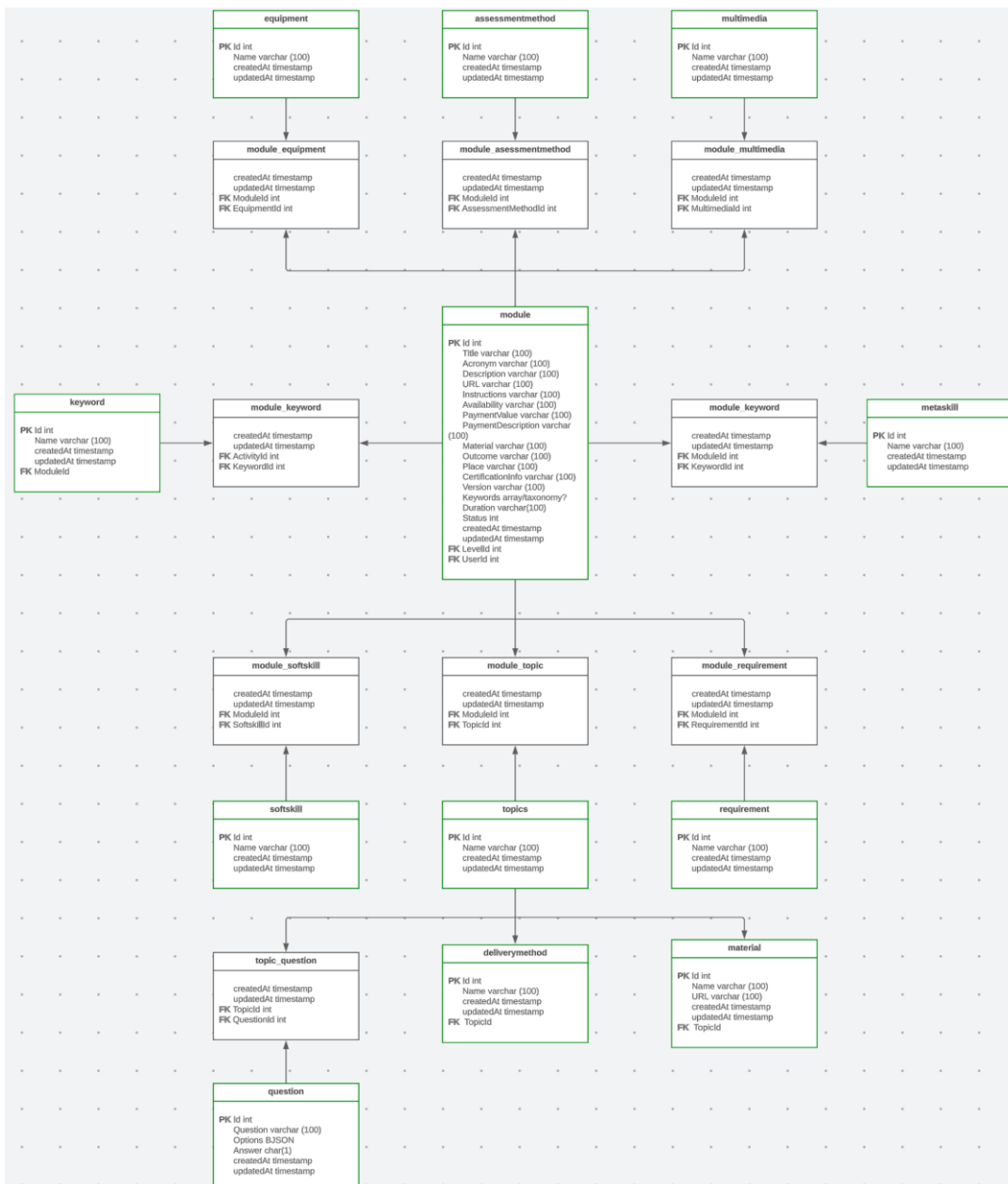
24. References

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6. Ruth Deakin Crick.: Key Competencies for Education in a European Context: narratives of accountability or care. European Educational Research Journal, 7(3), 2008.

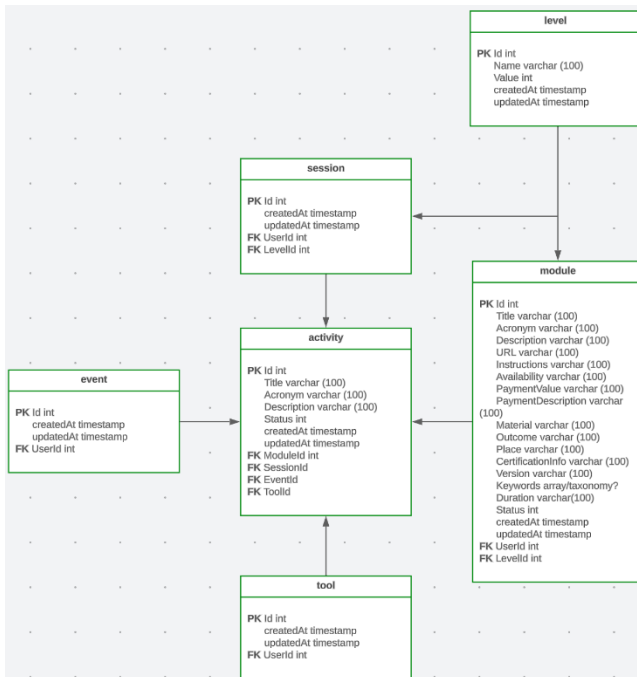
Annex A – Flowchart



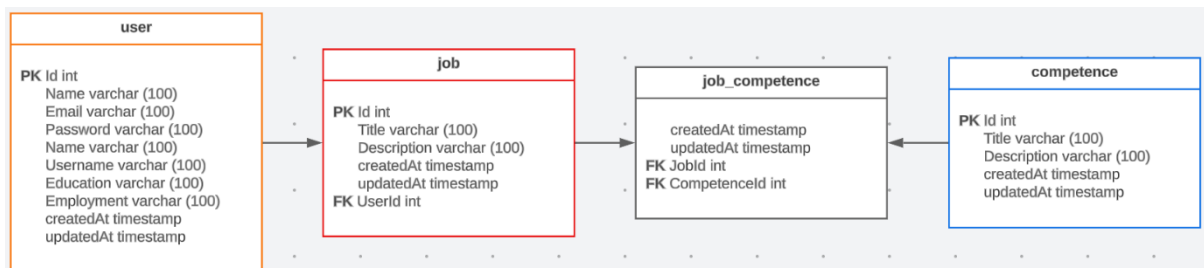
Annex B – Entity relation Model- Modules



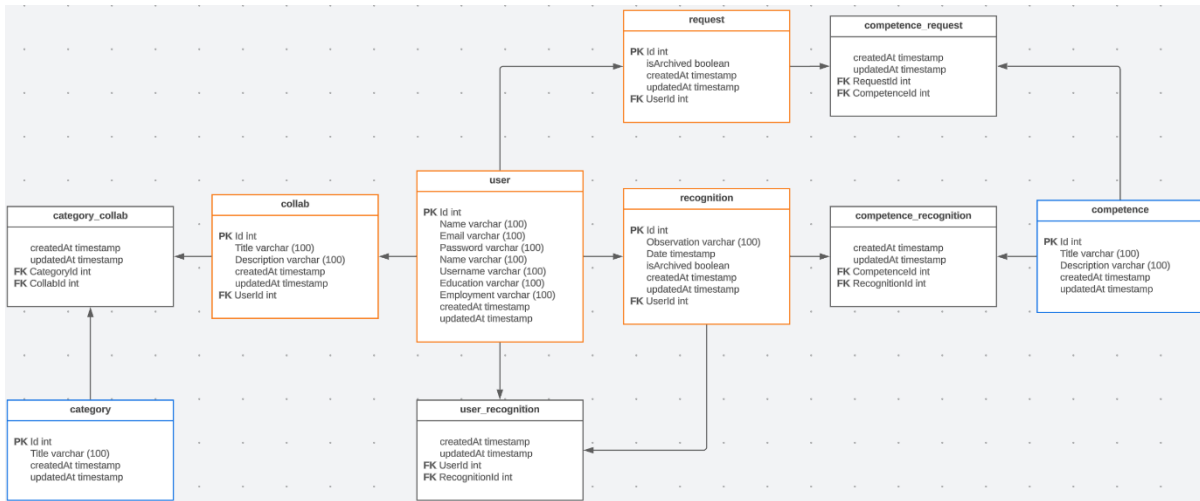
Annex C – Entity Relation Model- Pathway



Annex D – Entity Relation Model- Users



Annex E – Entity Relation Model- Users' Pathways



Annex F – Entity Relation Model- Registration

