



## D 3.9 Assets: ITINERIS Semantic Training Platform on Environmental Sciences - first draft



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## 1. INTRODUCTION

The first draft of deliverable 3.9 was planned to be released within the framework of the ITINERIS project and it is part of the actions of the Work Package (WP)3 concerning the details of the ITINERIS Semantic Training Platform on Environmental Sciences.

This first draft was expected to be released in Bimester 8 and to be included into the Intermediate Objective 3.5 of bimester 8; it is produced under the responsibility of the Operative Unit (OU) of the National Research Council, Research Institute on Terrestrial Ecosystems (CNR-IRET).

The deliverable 3.8 belongs to the activities of the Work Package (WP) 3 of the ITINERIS project and outline the technical and functional requirements that the ITINERIS Semantic Training Platform must meet, specifying the technical solutions planned to achieve them.

The document is structured into 4 chapters, including this one. Chapter 2 lists examples of already existing platforms with the aim of guaranteeing the transfer of knowledge in the field of environmental sciences to all components of civil society and citizens. Chapter 3 highlights the crucial features the ITINERIS Semantic Training Platform should present. At the end, Chapter 4 presents the list of acronyms used in this report.

## 2. STATE OF THE ART

The significance of readily available educational materials, such as digital objects, is widely recognized as a crucial component of knowledge transfer to all categories of stakeholders interested in science, including citizens and younger generations in educational systems.

From this perspective, the WP3 activity involves the training of staff of research infrastructures on science communication and citizen involvement in environmental science, aimed at strengthening the skills and experience of the scientists and technologies of RIs in transferring knowledge and involving citizens.

With regard to the training platform and the ITINERIS program, some of the key reference features for science communication and citizen engagement in science are listed below:

- Provision and management of numerous formats of educational digital objects
- Making available appropriate educational and communication materials
- Providing science games to engage citizens in science

The development of the ITINERIS science communication and navigation training platform must take into account the above points and the experience already available by looking at international initiatives and institutions at the European and global level.

Below, the main features of some of the environmental education platforms offering open digital resources to the public are introduced. The platforms are listed in alphabetical order:

**Khan Academy** provides courses and resources for school students. It offers courses and related tests to assess the knowledge acquired in schools of different degree and levels of preparation: <https://www.khanacademy.org/>.

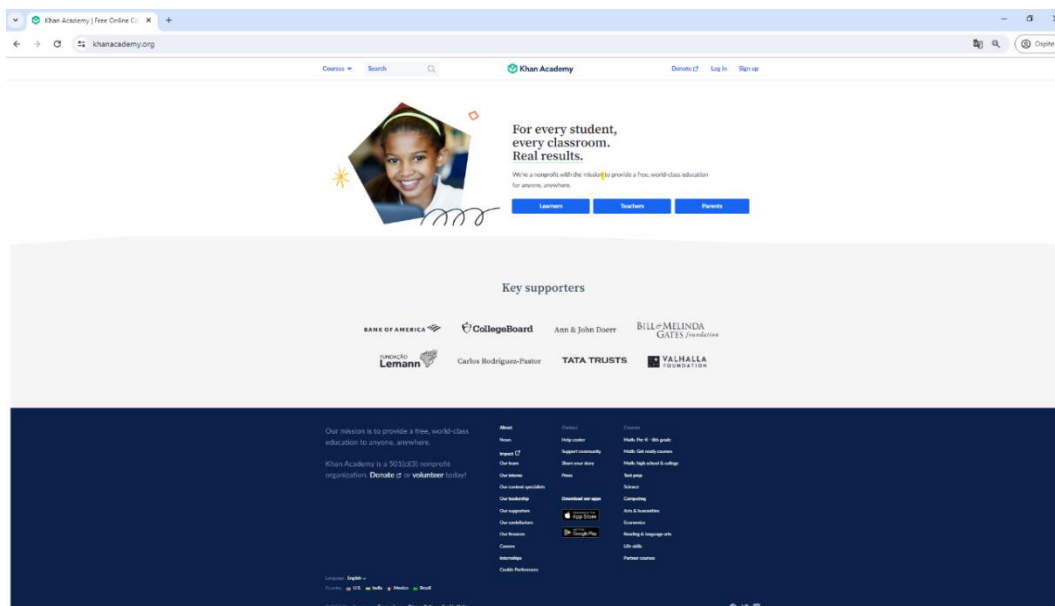


Figure 1. Portion of the interface of Khan Academy platform.

**LifeWatch Italy** offers a wide range of training opportunities for citizens, schools' and universities' students, researchers, and professionals working in the field of biodiversity and ecosystem functions and services, as well as communication materials. The LifeWatch platform is available at the following link: <https://www.lifewatchitaly.eu/comunicazione/>.

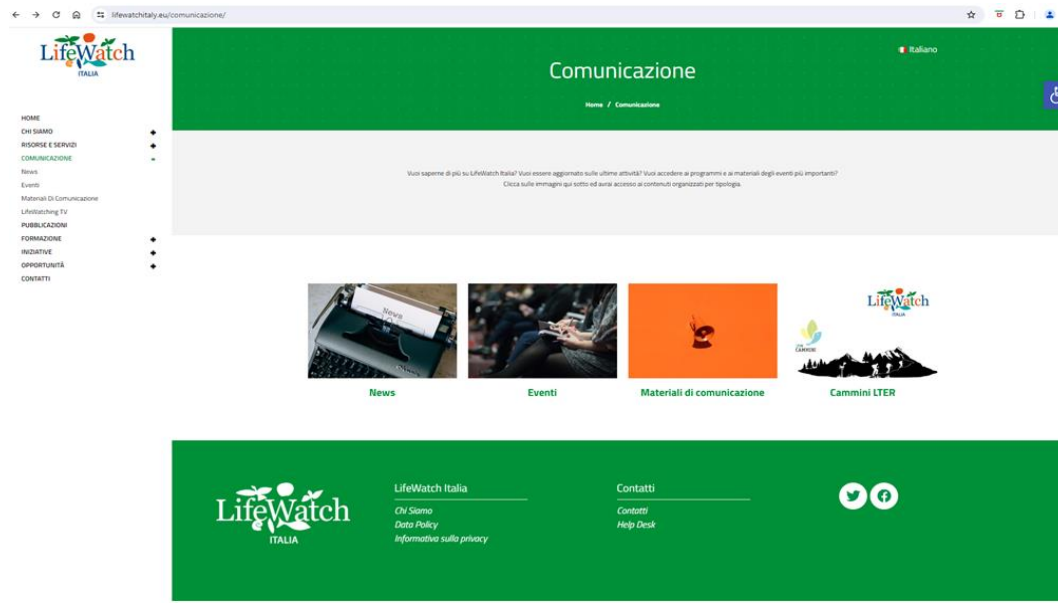


Figure 2. Portion of the interface of the LifeWatch Italy training platform.

**Learning for Nature** is a e-learning program offered by the United Nations Development Programme (UNDP) connecting biodiversity policymakers, changemakers, experts to promote biodiversity. The Learning for Nature platform offers a wide range of e-learning opportunities and can be accessed by following this link <https://www.learningfornature.org/en/>.

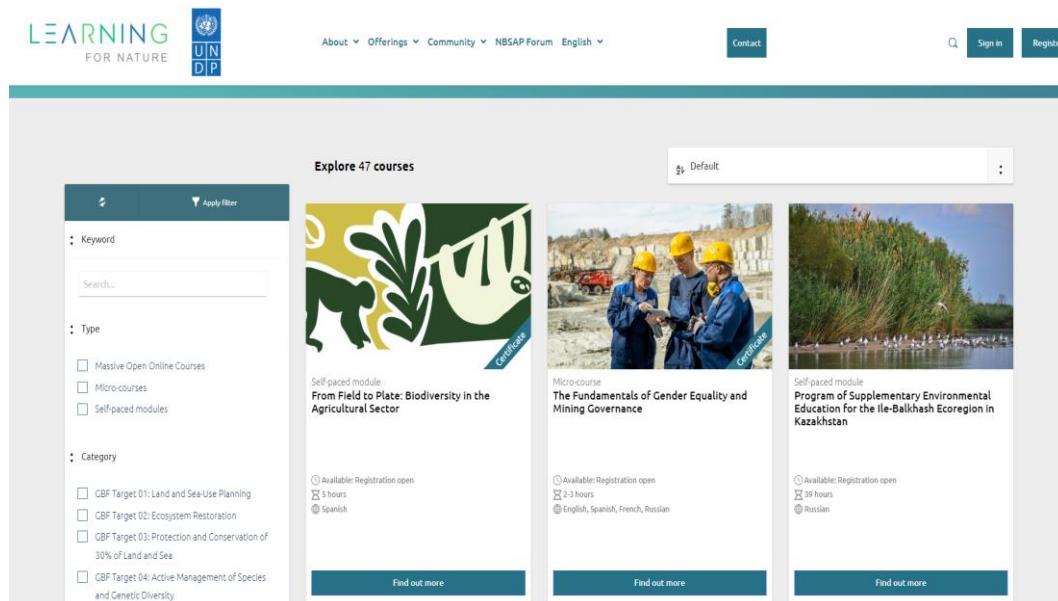


Figure 3. Courses section of the Learning for Nature platform.

**Nearpod** is a platform that allows teachers to create and share with students a series of interactive presentations, quizzes, videos, scientific games and other activities. It also offers a variety of features for tracking student progress and communicating directly with parents. The platform is available in: <https://nearpod.com/>.

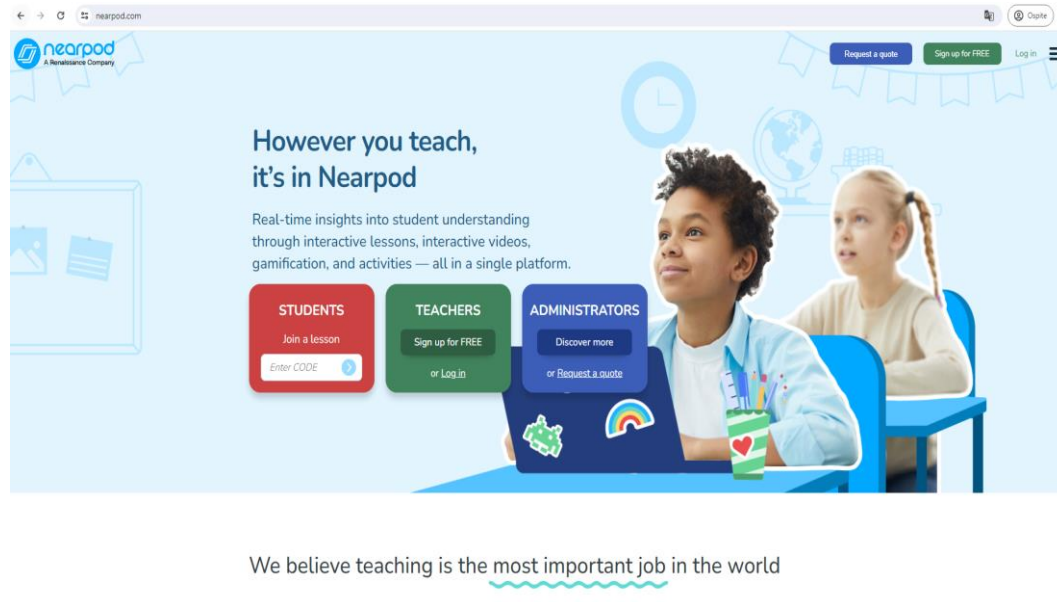


Figure 4. Interface of Nearpod platform.

### 3. ITINERIS SEMANTIC TRAINING PLATFORM ON ENVIRONMENTAL SCIENCES: TECHNICAL FEATURES AND NEEDS

The Semantic Training Platform on Environmental Sciences in Training Centre of the ITINERIS project will be used with the aim of ensuring the transfer of knowledge to all components of civil society and citizens. The Semantic Training Platform will be a platform for science communication and navigation of environmental science knowledge that will allow users to guide the user in performing searches on resources of different types, on the contents and themes of the Research Infrastructures, closely connected to the Training platform of the ITINERIS project.

In particular, the platform will provide two main macro-functions:

- Navigate into the knowledge, namely consult the material of interest on environmental science;
- Interact, this function must allow users to insert content (subject to prior approval by the platform administrators).

The long-term sustainability of the platform will be guaranteed through the interconnection with the Training and Gaming platform of LifeWatch Italy and the MetadataCatalogue of LifeWatch Italy and the availability of the LifeWatch Italy infrastructure.

As **access specification**, the platform must be recalled in the ITINERIS project Portal, in the ITINERIS Training platform and in the Lifewatch Italy Training platform, must follow a customized layout according to the visual identity of ITINERIS and also be integrated with other services developed in the project for the full functionality of the ITINERIS platform.

The platform must be developed with a multi-user and multi-scientific domain approach of interest and be connected to the sections relating to the ITINERIS Training metadata Catalogue, hosted in the LifeWatch Italy metadata Catalogue, fully guaranteeing the FAIRness of all products produced for the ITINERIS project.

The Semantic Training platform must therefore:

- be accessible directly from the ITINERIS project Portal and from the ITINERIS Training platform;
- arrange the resources to be metadated in the Metadata Catalogue of all digital objects, accessible in the appropriate Training section.

The platform must be built in all its components, including those of interfacing with the existing Training platform in LifeWatch Italy and the relative Metadata Catalogue.

Regarding the structural settings of the platform, it must be developed in such a way as to have an extremely simple, effective, intuitive and fun navigation for the target users to which it is intended; therefore, the contractor will be required to pay particular attention, in the design phase of the proposal, to the study of **User Interface (UI)** and **User Experience Design (UX)** suitable and consistent with the purpose of the individual areas of the platform. The platform must be developed as an application derived from the open-source **Content management service (CMS) WordPress**, based on the php language that constitutes its supporting application infrastructure.

The activities will be structured as better specified below:

- Design and implementation of a "Science Communication and Environmental Science Knowledge Navigation" platform, which will allow the dissemination of resources and results of research activities carried out by the various RIs, in connection with the ITINERIS Training project;

- Interfacing with the ITINERIS project Portal;
- Interfacing with the ITINERIS project Training Platform;
- Interfacing with the ITINERIS project Metadata Catalogue, hosted in the LifeWatch Italy Metadata Catalogue;
- Interfacing with the Authentication & Authorization services of LifeWatch ERIC.
- The Semantic Training Platform on Environmental Sciences will make available to users the scientific knowledge content created by the RIs. This content can be of various kinds, and in particular, the types of resources and the main formats can be documents (.pdf), presentations (.ppt), videos (.mp4), images (.jpg, .png), podcasts, TedX, games.

The platform will be accompanied by a support area, which includes a Knowledge Base, specially structured to allow navigation, equipped with a dedicated Knowledge Base search engine.

Focus on the end users of the Semantic Training platform, they can be grouped into:

- Research and technology infrastructure personnel working in science communication offices for the infrastructures: all the technical-administrative-scientific staff of the research infrastructures that are part of the ITINERIS project consortium and deal with the communication section for the infrastructures for which they operate and collaborate.
- PhD students and master's students: participants in the PhD courses and master's programs activated by the ITINERIS consortium.
- Users of research infrastructure services: users of RI services, who will find resources and materials related to the different services.
- Students: students, who will find scientific resources and materials that can be consulted.
- Citizens: citizens, who will find scientific resources and materials that can be consulted.

The ITINERIS Communication platform will allow users, based on their authorization profile, to manage resources through functionalities and/or tools for creating, uploading, approving, classifying, publishing, searching and downloading resources.

Support material for the creation of scientific content must be made available to RI's users, in order to standardize and standardize the platform's resources. In particular, a style guide should be defined and presentation templates, flyer/brochure templates and guidelines for creating resources should be made available to users within the platform. These guidelines will be functional to the creation of scientific knowledge content by RI users and will represent the elements to be disseminated.

The platform will provide various search functionalities (e.g. simple, advanced, semantic, ...). Data access functionalities must be developed, ensuring that any type of user has the possibility of quickly identifying the elements they need to address their needs and/or to use a service. In particular, solutions should be explored that allow for searches and navigation of concepts, topics and entities on structured data, reducing search times for information and enhancing the RI's heritage of skills and experience in the biodiversity sector. Search functionalities should be designed with the aim of providing results that are accurate, relevant and meaningful, or that correspond to what the user had in mind.

### 3.1 Scientific game for communicating science in an effective and fun way

A further addition from the perspective of communication plans and dissemination of research results in the field of environmental sciences, it is also foreseen an additional science communication tool, a scientific game called "BioCross" or "Biodiversity Crossword Game".

The selected typology is a crossword game that will explore vocabulary in the various environmental domains ("Atmosphere", "Marine Domain", "Terrestrial Biosphere" and "Geosphere"). Through a "learning by gaming" approach, the game will enable science communication and citizen engagement in science, including students from lower and upper secondary schools. This game will be developed and uploaded on the ITINERIS Semantic Training platform and, to ensure long-term sustainability, also on the LifeWatch Italy Training & Gaming platform.

The game will propose the activity of composing words belonging to the field of biodiversity, having at its disposal a set of proposed letters, in accordance with a scale of complexity and increasing levels. Starting from a minimum number of letters, it will be possible to create new words that will be inserted into the crossword puzzle provided and all of them will have to be found to reach the final solution

## 4. LIST OF ACRONYMS

CMS: Content management service  
OU: Operative Unit  
UNDP: United Nations Development Programme  
RI: Research Infrastructure  
UI: User Interface  
UX: User Experience Design  
WP: Work Package