



Deliverable 3.1

Asset: ITINERIS Training Centre Platform



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1. INTRODUCTION

The deliverable 3.1 is produced within the framework of the ITINERIS project and it is part of the activity 3.1 of the Work Package (WP) 3 concerning the development of the Training Platform for the scientific and technical personnel of the 22 Italian environmental Research Infrastructures (RIs), the PhD students and the RIs employees on science communication involved in the project. This deliverable is included into the intermediate objective of bimester 4 and it is produced under the responsibility of the Operative Unit (OU) of the National Research Council, Research Institute on Terrestrial Ecosystems (CNR-IRET) in Lecce.

The main aim of this deliverable is to provide a general overview of details on the structure and contents of the ITINERIS training centre platform.

The document is structured in **6** chapters, including this chapter. An overview on the European environmental training platforms is given in chapter 2. Chapter 3 reports the current identified technical features and needs identified for the Training Centre Platform ITINERIS. Acronyms (ch.4), glossary (ch.5) and references (Ch.6) are reported at the end of the document.

2. STATE OF THE ART: EUROPEAN ENVIRONMENTAL TRAINING PLATFORMS

The importance of availability of training materials as digital objects and of hosting FAIR training platforms is well recognized as an essential component of the knowledge transfer, to all categories of science stakeholders including citizens and young generations at the school systems. In the particular case of the European Research Infrastructure (ERI), the development, findability and accessibility of training digital object are essential to the all users of the ERI, who needs to get the highest profit from the advanced equipment and services of the Infrastructure. Appropriate training materials are also important for the employee of the ERIs, who are both users and trainers for the external user categories and are important to all other stakeholder categories (Callan *et al.* 2010; Garrison 2016; Rawashdeh *et al.*, 2021).

As regards the ITINERIS training platform and training programme, some of the main reference features reference are reported below:

- Supply of advanced courses on specific scientific topics
- Providing and management of many formats of training digital objects
- User status monitoring
- Preparation of evaluation tests
- Making available

The development of a ITINERIS training platform needs to take into consideration the above reported points and the experience already available looking at the most advanced training platform of other ERIs or international Initiatives and Institutions at the European and global level.

Here, are introduced the main characteristics of some of the most famous European environmental training platforms that offer training courses and digital resources open to the public and available in multiple languages. The platforms are listed in alphabetical order:

The European Life-science Infrastructure for Biological Information (ELIXIR) is a life sciences infrastructure for the development and bioinformatic analysis of biological data. It provides a Moodle-based training platform and a training catalogue of resources that supports the European training community of trainers and trainees. It has a very effective support users contents search and Training Toolkit (Tess) which favours trainers with a train-to-trainers approach. (<https://elixir-europe.org/platforms/training>).

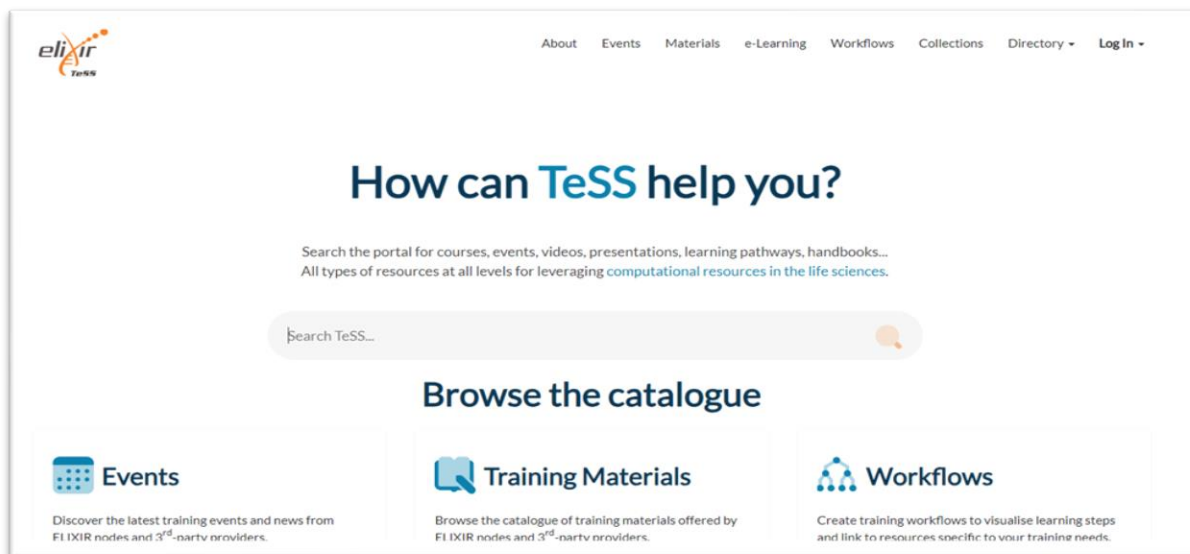


Figure 1. Portion of the interface of the training portal for the ELIXIR community.

European Union ACADEMY is an EU online hub containing high-quality educational resources and valuable information, produced directly by EU institutions, for workers. The training platform offers online courses and many format of resources on an impressive range of scientific topics, including environmental sciences: climate changes, air and water quality, land use, biodiversity and natural resources. It offers a number of online resources, including e-book, video, articles and study cases (<https://academy.europa.eu/>).



Figure 2. List of topics in the EU academy platform.

European Marine Biological Resource Centre ERIC (EMBRC) service platform has a platform dedicated to Marine education and training to different targets of the current and the next generation of Blue workers. The platform is Moodle-based and provides a training catalogue with a series of short training resources in different formats (e.g. video, application, text document, presentation) on many ISCED categories linked to the marine environment. (<https://www.marinetraining.eu/about>).

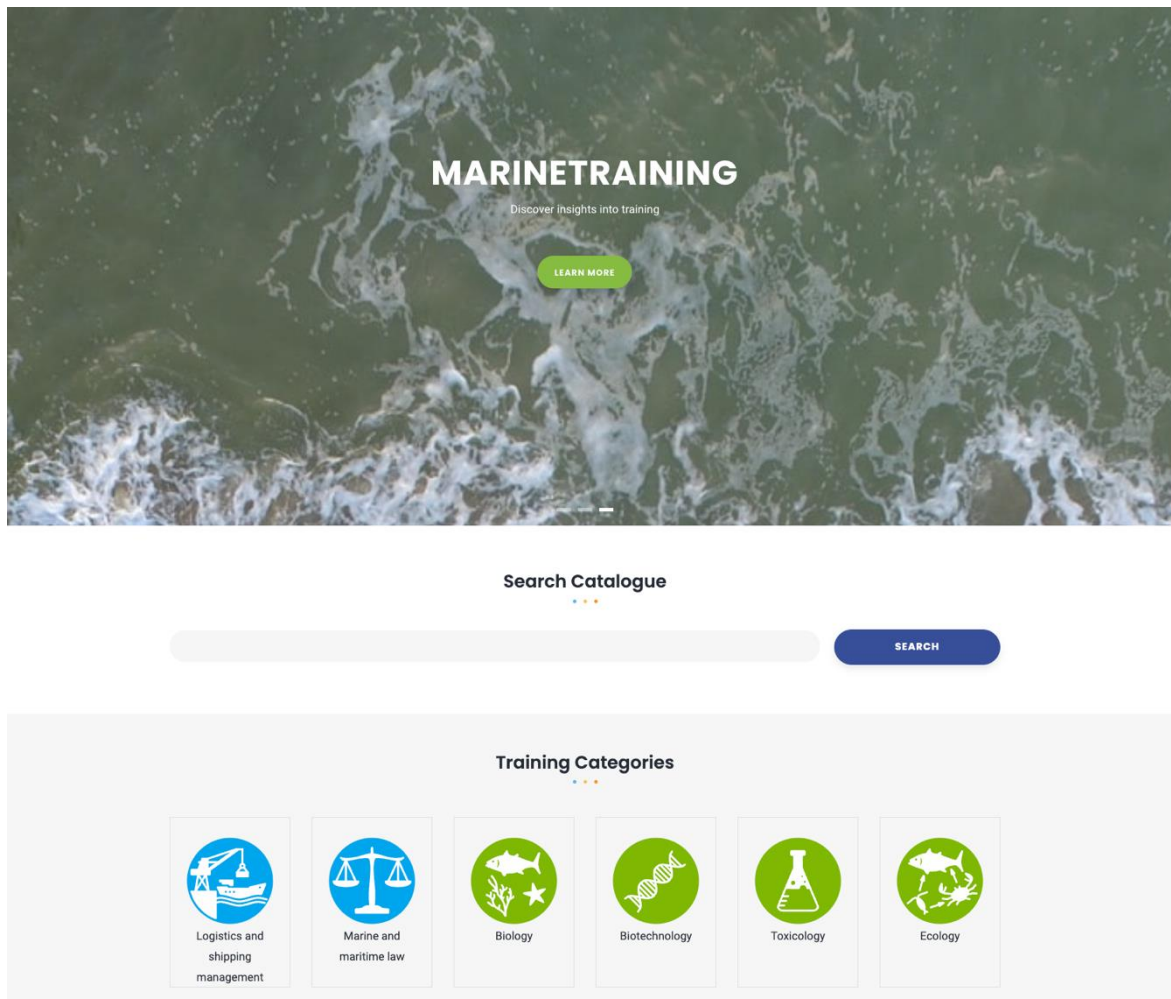


Figure 3. Portion of the interface of the Marine Training platform.

LifeWatch ERIC provides a wide range of training opportunities for citizens, students, researchers and professionals working in the field of biodiversity and ecosystem functions and services. The training activities of Italian node, i.e., LifeWatch Italy, are organized in order to increase skills and knowledge in the field of biodiversity and ecosystem functions and services, facilitating the development of new research collaborations. The LifeWatch training platform is Moodle-based, and the formative offer includes online courses, Webinars, organization of conferences and summers schools, scientific games and VRE. It offers a Catalogue containing different resources related to metadata and training materials. (<https://www.lifewatch.eu/training-and-education/>).

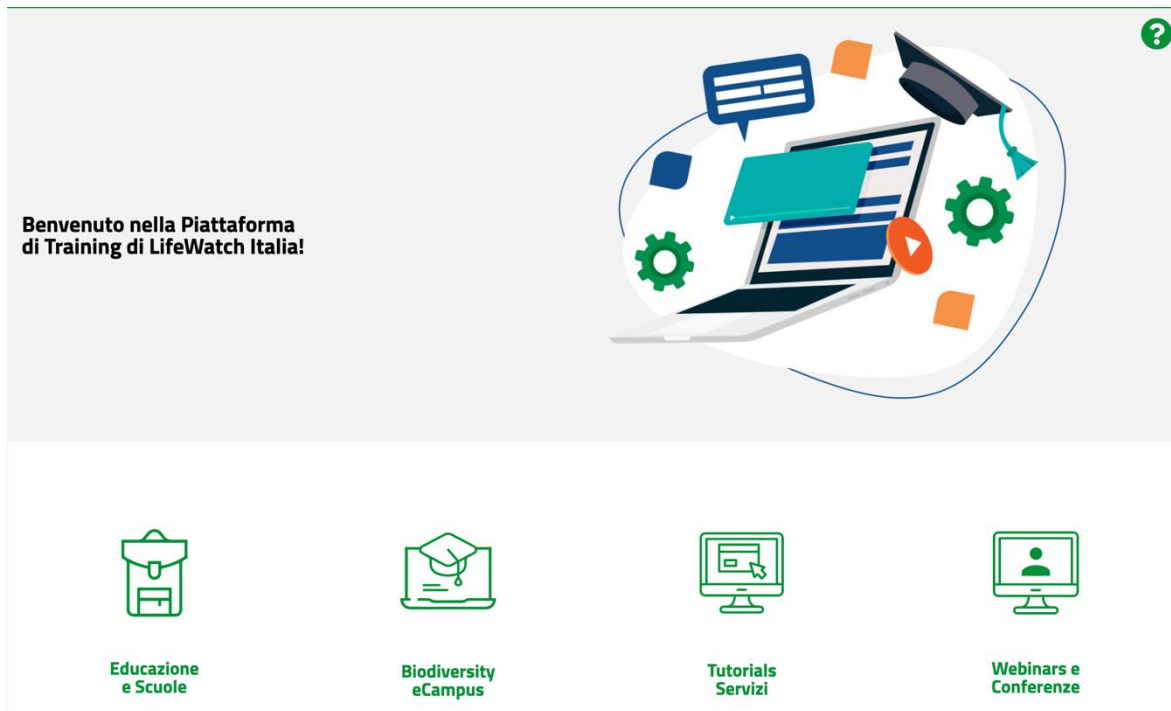


Figure 4. Portion of the interface of the LifeWatch Italy training platform.

The **United Nations Institute for Training and Research (UNITAR)** provides online courses at different levels on many topics such as environmental science, sustainability and climate change (<https://www.unitar.org/courses-learning-events>).

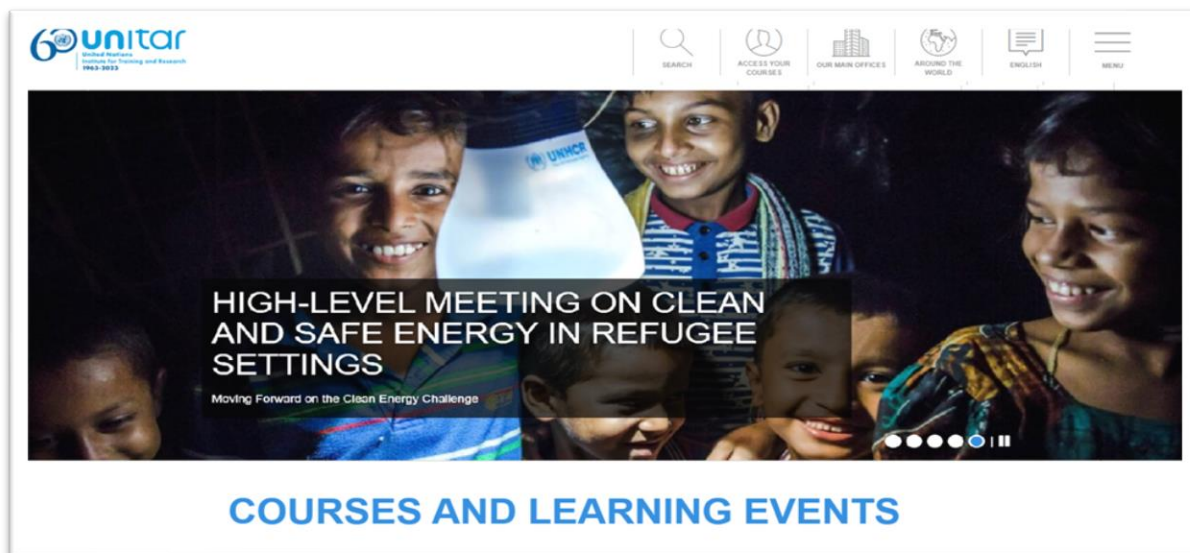


Figure 4. Portion of the interface of the UNITAR training platform.

3. ITINERIS TRAINING CENTRE PLATFORM: IDENTIFIED TECHNICAL FEATURES AND NEEDS

The ITINERIS Training Platform is planned to represent the Hub of the training digital object of the Italian nodes of the European Research Infrastructure and key national Infrastructures in the Environmental ESFRI domain, being the central component of the ITINERIS Training Centre. It responds to the need of a unique access point to the training materials produced by the Environmental RIs for the RI employee and users and for all Environmental Science stakeholders; it has to guarantee advanced knowledge, scientific rigor, FAIR contents and user-friendly content organization and management system. To ensure content findability and accessibility, all digital training objects will be meta-dated with the metadata exposed on a thematic section of the ITINERIS metadata catalogue, as well as on the metadata catalogue of LifeWatch Italy, which ensures the long-term sustainability of the Platform.

According to the Training Programme of ITINERIS, the Training Platform prioritizes the RIs' employees and the next generation environmental scientists and citizen scientists, who are the main direct beneficiaries of the training programme.

The platform architecture is based on a *user experience* (UX) and *user interface* (UI) analysis and integrate a user friendly front-end software platform and content management system (Word Press) and a powerful and widely used course management system (Moodle). From a functional point of view, the platform architecture has a hierarchical configuration for the target user groups and the ITINERIS training programme components (targeting RIs employees, next generation scientists, citizen scientists), with dedicated platform areas. The ITINERIS Training Platform will provide a series of structural components with a series of interfaces that:

1. facilitate interoperability with external sources;
2. allow the users to interact through different roles and domain target;
3. simplify the organization of ITINERIS training programme; and,
4. promote the use and reuse of digital objectives produced during throughout the realization of the ITINERIS training programme.

The training platform ITINERIS will be developed using a service-based architecture that allows services to be deployed independently, simplifying system management, maintenance and scalability.

The main services of the training platform ITINERIS are the following:

- User management service (UMS)
- Content management service (CMS)
- Training delivery, course management service
- Course results evaluation service

The technical solution, which provides a series of software and services necessary for the complete set-up of the training platform and its connection with the training resource category in the metadata catalogue of ITINERIS, will be also integrated into LifeWatch Italy training platform being connected with the training resource category of the LifeWatch Italy metadata catalogue ensuring the exposition of ITINERIS digital training objects fully compliant with the FAIR principles. The Training Platform is designed to be organised in target user and content category sections, every one of each providing to users a *knowledge*

base including guides and training material to ensure a friendly and easy use of the section and of all training digital objects provided.

The three target groups of the ITINERIS training activities are presented with some details on their level of involvement in the training.

The first group is the scientific and technical staff and the RIs employees on science communication of the 22 Italian RIs involved in the project. This group will benefit of the user-friendly digital training objects developed during the advance training courses organized in the training programme activities.

The second group is represented from the PhD students from XXXVIII and XXXIX cycle from the Universities of Naples (Federico II and Parthenope), Pisa, Salento and Tuscia, and all the PhD students with a domain-specific curriculum in ITINERIS project. This group will benefit of the user-friendly digital training objects developed during the advance training courses organized in ITINERIS.

The last group is constituted from all the community users that benefit from services and digital tools of the RIs involved in the project and who are looking or would like to upload training materials such as tutorials on that. This group will benefit and will contribute to increasing training materials and knowledge on all infrastructure reinforce services developed in the project.

The Training Platform is designed to have single **access point**, which is from the ITINERIS Hub, with a direct link on the Hub homepage or through the ITINERIS metadata catalogue. The ITINERIS Training Platform would be also accessible from the LifeWatch Italy training platform and metadata catalogue, both as a risk minimization strategy and to ensure long-term sustainability of the platform itself and the related digital training objects.

WordPress is selected as the Content Management System (CMS) of the training platform, being an open-source widely used technology that:

1. allows users to manage from any digital devices;
2. let the administrators to edit every sections without entering in any programming language; and
3. additionally, is designe to provide more features and functionalities for future upgrades, thanks to a wide library of plugins.

Moodle Learning Management System (LMS) is selected as Course Management System of the training platform. Moodle is open-source-based with many benefits to both users and system administrators, such as:

1. the user-friendly interface;
2. the facility to be customized;
3. the high flexibility; and,
4. the simplicity of integration with other software and plugins due to the certification as Learning Tool Interoperability (LTI) (e.g. Xin, et al., 2021; Gamage et al., 2022).

Moreover, as one of the most widely used Learning and Course Management System (LMS/CMS) in the Universities at the international level, it is well known by many users and it is tested in deep by University level users, minimizing risks of mis-functioning and already offering a wide catalogue of customization examples to match specific needs of the Training Programme.

The main platform requirements are defined as follows:

- Extremely simple, effective and intuitive navigation;
- Integration with other infrastructure systems;
- Support for different formats of training content;
- Providing of synchronous and asynchronous training courses
- Support and Service to Users;
- Measurement of learning outcomes and self-evaluations of training courses;
- Hosting all the training digital objects that will be produced during the training courses ITINERIS, including webinars, videos, TED, flipbooks, text documents and presentations.

The support and service to users include the training course evaluation tools relevant to ensure the effectiveness of training and the success of the target users; they measure the results achieved by the target users, identify areas for improvement and adjust the courses to make them more effective over time.

4. LIST OF ACRONYMS

CMS: Content Management System

DO: Digital Object

ERI: European Research Infrastructure

ERIC: European Research Infrastructure Consortium

ESFRI: European Strategy Forum on Research Infrastructures

FAIR: Findable, Accessible, Interoperable and Reusable

ISCED: International Standard Classification of Education

ITINERIS: Italian Integrated Environmental Research Infrastructures System

LMS: learning management system

LTI: Learning Tool Interoperability

OU: Operative Unit

RI: Research Infrastructure

UI: User Interface

UMS: User Management Service

UX: User Experience

WP: Work Package

5. GLOSSARY

The following definitions were taken into consideration when drafting the document:

Content Management System

A content management system is a software application that allows users to generate, modify and deliver digital contents.

Knowledge Base

A Knowledge base is a system for collecting, storing and sharing knowledge that can include FAQs, guides, introductory digital documents that help users respond to their queries

DataBase Management System

A DataBase Management System is a software that permit to create, storage, organize and updates a series of data.

Learning Management System

Learning Management System are specialized Learning Technology Systems based on the state-of-the-art Internet and WWW technologies in order to provide education and training following the open and distance learning paradigm.

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