PATTERN.
Empowering Open and Responsible Research and Innovation

D2.3

First version of the training platform and modules sustainability plan

Project Name	Piloting open and responsible Activities and Trainings Towards the Enhancement of Researchers Networks
Project Acronym	PATTERN
Contract No.	101094416
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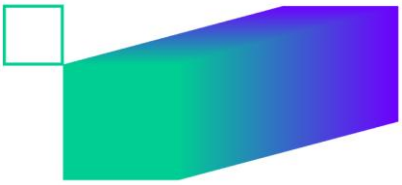
Topic	HORIZON-WIDERA-2022-ERA-01-44: Developing and piloting training on the practice of open and responsible research and innovation
Start of Project	1 January 2023
Duration	42 months

OUR CONSORTIUM

Funded by the European Union



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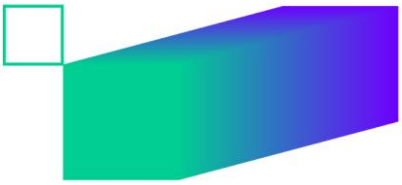

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Revision History

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0.1	10/04/2025	Eric Cherel	First draft shared with partners
0.2	23/04/2025	APRE, OpenAIRE, SISSA, ESF, UniSR, Uminho, DANS	Contributions from partners integrated
1.0	30/04/2025	APRE	Final version submitted

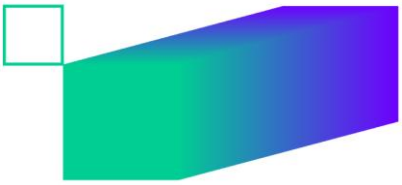
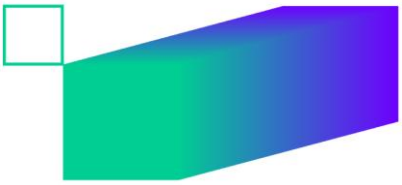


Table of Abbreviations and Acronyms

Abbreviation	Meaning
AAI	Authorization Infrastructure Architecture
AI	Artificial Intelligence
CDE	Communication, Dissemination and Exploitation
D	Deliverable
D&E	Dissemination & Exploitation
DMP	Data Management Plan
E2E	End-to-end
EOSC	European Open Science Cloud
ETHRD-IG	Education and Training on Handling of Research Data - Interest Group
GNI	Gender, non-discrimination and inclusion
KPI	Key Performance Indicator
LMS	Learning Management System
M	Month
NCP	National Contact Point
NOADs	National Open Access Desks
OA	Open Access
OER	Open Educational Resources
ORRI	Open and Responsible Research and Innovation
PBL	Project-Based Learning
RDA	Research Data Alliance
RDM	Research Data Management
T	Task
TtT	Train-the-Trainer
WP	Work Package



List of project's participants

Short name	Legal name
APRE	Agenzia per la Promozione della Ricerca Europea
AU	Aarhus Universitet
LOBA	GLOBAZ, S.A.
ESF	Fondation Europeenne de la Science
ZSI	Zentrum Fur Soziale Innovation GMBH
SISSA	Scuola Internazionale Superiore di Studi Avanzati di Trieste
LPI	Learning Planet Institute
OpenAIRE	OpenAIRE AMKE
UHelsinki	Helsingin Yliopisto
TCD	Trinity College Dublin
IZTECH	Izmir Institute of Technology
UDebrecen	Debreceni Egyetem
HEAL-Link	Panepistimio Patron
EARMA	European Association of Research Managers and Administrators
UniSR	Università Vita-Salute San Raffaele
DANS	Koninklijke Nederlandse Akademie Van Wetenschappen - KNAW
RBI	Ruđer Bošković Institute
SciLink	Stichting SciLink
Uminho	Universidade do Minho

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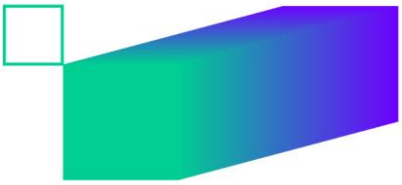

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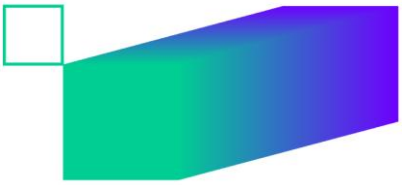


Executive Summary

This report, Deliverable 2.3 of the PATTERN project, outlines the initial sustainability plan for the project's training platform and modules. The PATTERN project aims to pilot open and responsible activities and trainings towards the enhancement of researchers' networks, focusing on Open and Responsible Research and Innovation (ORRI). This sustainability plan is focused on ensuring the long-term impact and accessibility of the training resources developed by the project beyond its funding period.

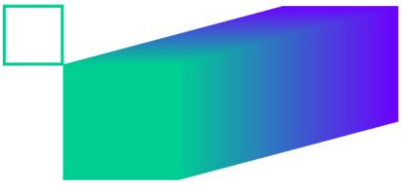
The core of the project's sustainability lies in its training platform and the comprehensive modules it hosts, designed to equip researchers with essential ORRI skills and knowledge. The plan addresses various dimensions of sustainability, including technical, content, community, and institutional aspects.

Technically, the plan emphasizes the importance of using open-source technologies, ensuring interoperability, and planning for the platform's maintenance and potential evolution. Content sustainability focuses on strategies for updating and curating the training materials, incorporating feedback, and potentially expanding the content based on emerging needs in the ORRI landscape.

Community engagement is key to PATTERN's consortium sustainability strategy, with plans to foster an active user base, encourage contributions to the training materials, and build a network of trainers and ORRI advocates. Institutionally, consortium partners explored avenues for integrating the platform and modules into existing university curricula and training programs, as well as seeking recognition and support from relevant organizations.

The report acknowledges potential challenges such as securing long-term funding, maintaining technological relevance, ensuring content remains current and accurate, and navigating the diverse institutional landscapes across Europe. To mitigate these risks, the plan proposes strategies including diversifying funding sources, adopting flexible and modular approaches to both the platform and content, and building strong partnerships with key stakeholders.

In conclusion, the D2.3 report presents a robust foundational plan for sustaining the PATTERN project's training platform and modules. It also demonstrates the combined effort of the partners in the project to reflect on and consider the long-term sustainability of PATTERN results. By addressing technical, content, community, and institutional factors, and outlining clear mitigation strategies for potential challenges, PATTERN aims to ensure that its valuable ORRI training resources remain accessible and impactful for the European research community in the long term. This plan serves as a living document that will be further developed and refined throughout the project's lifecycle, culminating in D2.4 "Final version of the training platform and modules sustainability plan", due in M42.



1 Introduction

This deliverable covers the area of training platform and modules sustainability. The elements that require sustainability consideration include the PATTERN Digital Ecosystem, which is made of three parts – (1) PATTERN website, (2) courses that are stored on OpenPlato (a Moodle learning content management system owned and run by OpenAIRE), (3) Projects (a project-based learning system owned and run by Learning Planet Institute). An integrated login system links OpenPlato and Projects. For these systems, there are two interdependent aspects – first, technical sustainability (making sure that the software will continue to run in the next 5 years); and financial sustainability (ensuring that the costs of running the system, such as hosting and the time for maintenance) are covered.

Secondly, partners looked at the eight courses that are developed and tested in PATTERN. For each of them, they have been considered how to maintain the courses up to date over the coming five years. This includes ensuring that the content remains relevant and current, and that the case studies that are used in the problem-based learning activities are relevant to the learning objectives.

Thirdly, partners looked at the organisational and institutional aspects that are relevant of the sustainability. The organisational aspects influence the sustainability because they will impact the way that the courses are integrated within institutions.

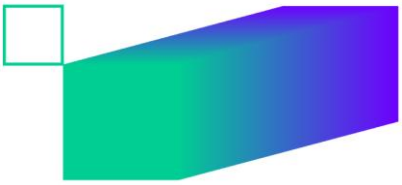
1.1 Methodology

The information that is used in this report came from internal reviews of WP2 contributors. During year 2 of the project, the consortium agreed that WP2 and WP3 warrant a dedicated weekly meeting to ensure coordination and progression. These one-hour meetings provided an ongoing information exchange, with partners sharing the development and implementation of PATTERN elements – in particular courses and the digital environment – with WP2 and WP3 leading teams. As a result of these discussions, issues that are important for the sustainability of the project's outputs emerged and were captured. Following this, dedicated sessions during the second Open Studio cycle were devoted to the sustainability strategy. The outcome of the open studio was gathered in the internal report and an edited version of relevant aspects is shared here.

The platforms usage Key Performance Indicators (KPI) information is extracted directly from the system logs or from specialized analytics tools such as Mixpanel, which analyze online usage.

1.2 Levels of sustainability

A key consideration in PATTERN is sustainability – ensuring that the project's outputs remain useful and accessible over time. This approach is applied to both the online technology platforms created by the project and the courses it offers, each with three defined levels of sustainability.



1.2.1 Sustainability of Technology Platforms

For the technology platforms developed in PATTERN (such as online learning portals or resource repositories), three levels of sustainability are considered:

Static Content Preservation: At the basic level, the platform's content (e.g. project documents, learning materials, and static resources) remains accessible even after the project ends. In this static state, all the valuable information and documents are preserved online for reference, ensuring nothing is lost even if no new activity occurs on the platform.

Active Use and Engagement: The second level ensures that new students, teachers, and researchers can continue to use and interact with the platform. In this sustained operational phase, the platform stays live and open to fresh users, allowing future cohorts to benefit from its tools and materials. Learners and instructors can engage with the content (and even contribute feedback or minor updates), keeping the platform active and relevant for a growing user base.

Continuous Improvement and Growth: The highest sustainability level involves ongoing development and expansion of the platform. Here, the platform not only remains active, but it is also regularly updated with new features, improvements, or content enhancements. Over time, the platform reaches an ever-growing audience beyond the initial target group, extending its impact. This means the platform evolves based on user needs and technological advancements, continuously improving while attracting more users.

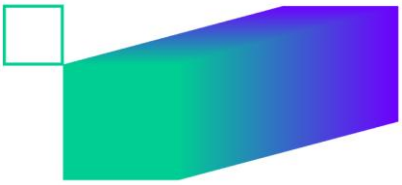
1.2.2 Sustainability of Courses

Similarly, the courses and training programs offered through PATTERN have three parallel levels of sustainability:

Open and Accessible Course Materials: At the basic level, all course materials (lecture notes, slides, readings, tutorials, etc.) remain available as a long-term resource. Even after a course session has concluded, these materials are kept online or in repositories in OpenPlato, Projects and Zenodo, so that past participants and other interested learners can access them for reference. This ensures the knowledge disseminated by the course stays accessible and can continue to inform or guide research practice.

Ensuring the sustainability of PATTERN's training materials is essential. Static resources like PDFs will be archived on Zenodo, which provides DOIs for better citation, attribution, and alignment with FAIR and Open Science principles. To enhance visibility, outputs should also be integrated into platforms such as EOSC, OpenAIRE, and UNESCO repositories. Clear metadata, authorship, and version control are key to avoiding content fragmentation. While Zenodo offers long-term preservation, dynamic courses will be hosted on platforms like OpenPlato, ensuring continued accessibility beyond the project's end.

Reuse, Re-run of Courses and Train the Trainers Module: The second level focuses on extending the life of the course by developing guidelines for re-use, making templates available and offering it again or adapting material for new groups. In

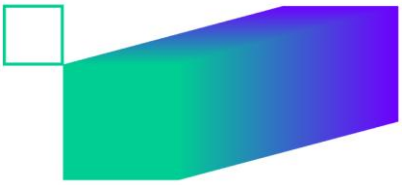


PATTERN, courses can be reused or re-run in the future, enabling new learners to enrol and new instructors to teach the content. By re-running courses (or integrating the materials into other training programs), the project allows successive cohorts to benefit from the training without needing to develop new courses from scratch. This reusability demonstrates an active ongoing value of the course content. In parallel, self-paced *train the trainers* modules will provide methodological and didactic training for trainers to get insight not just on the content but on ways how these courses have been adapted and developed for PATTERN target audiences. D 2.1. covers all main aspects in all eight thematic areas around training methodology and learning paths developed to serve audience needs.

Continuous Update and Expansion: At the highest level, the course content and delivery are continuously updated, expanded, and scaled up. The curriculum is regularly refined based on participant feedback and new developments in ORRI, keeping the training up-to-date and improving its quality. Additionally, the course is offered to an increasing number of participants – for example, by opening it to other institutions or offering more frequent sessions. This continuous enhancement and broader outreach ensure the course remains current, grows in scope, and has a wider impact over time.

1.2.3 Pedagogical innovation sustainability

In addition to the other aspects of sustainability, the PATTERN courses also involve the use of multiple channels for engagement and for the reuse of training material (ex. flipped classrooms, hybrid sessions, gamification, etc.). In both training platforms that are used in PATTERN there is a scope for a teachers' forum as well as sharing teachers' comments and guidelines on Projects. In this way, the project can share the pedagogical innovations that were used to teach a specific element and allow other teachers to develop them further or add their own approach to the teaching.



2 Technical sustainability

2.1 Introduction to technical sustainability

As stated in the introduction, PATTERN's digital ecosystem consists of three main platforms:

- A general static web site that explains the project's philosophy and guides learners and teachers towards relevant resources.
- The Projects platform, dedicated to learners' activities, centred on project-based learning (PBL) and use cases.
- The OpenPlato platform, a Moodle learning management system (LMS) hosting pedagogical resources for teachers who want to implement ORRI in their courses.

Ensuring the continued operation of each of these components involves maintaining the underlying codebases, infrastructure, and interoperability between platforms, as well as securing commitments from hosting institutions to provide basic maintenance and updates beyond the end of the PATTERN grant.

2.2 PATTERN website

The PATTERN Website is an information, mostly static web site powered by a WordPress, a web content management system. As this technology is widely used, it is easy to maintain and does not necessitate large resources nor deep technical expertise to maintain, even after the end of the PATTERN grant. However, technical security updates will be needed to prevent malicious attacks, such as defacing or security breaches. LOBA will stay responsible for the web site maintenance and security for five years after the end of the project.

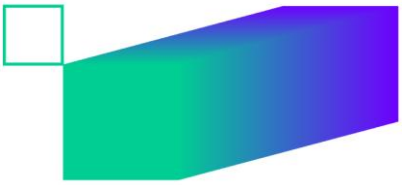
LOBA estimated the costs to be low, covering web site hosting, site maintenance and domain registration.

An open question is the possible decommissioning of the web site once OpenPlato and Projects become mature enough, which would simplify the overall user experience and reduce the maintenance costs. This strategy will be explored in the last year of the PATTERN project.

2.3 PATTERN courses on OpenPlato

2.3.1 Description of technical sustainability and maintenance

OpenPlato, developed by OpenAIRE on the Moodle platform, is an LMS and metadata-driven training catalogue for Open Science, Research Data Management (RDM), and FAIR principles, supporting European and global training needs aligned with European Open Science Cloud (EOSC) policies. Operated by the University of Warsaw's ICM, OpenAIRE, and its Support and Training Standing Committee, it's financed and governed by OpenAIRE, a key player of Open Science. OpenPlato aims



to consolidate training, enable reuse, and foster collaboration among research stakeholders.

OpenPlato prioritizes sustainability and interoperability, leveraging Moodle's ecosystem and educational standards like SCORM and xAPI for multimedia integration and compatibility with other platforms. Courses use structured metadata based on Research Data Alliance (RDA) Education and Training on Handling of Research Data - Interest Group (ETHRD-IG) recommendations for discoverability, including provenance, license, and thematic relevance. A catalogue extension structures courses into "training spaces" by country, theme, or project, facilitating multilingual content, national adaptations, and domain-specific communities, allowing institutions to curate branded portfolios within the OpenPlato federation.

OpenPlato is integrating with the EOSC Authorization Infrastructure Architecture (AAI) for seamless access using institutional credentials, promoting its recognition within the European Open Science landscape. The platform offers personalized dashboards, gamification, and modular course design with open/self-paced or instructor-led options, emphasizing interactivity and practical skills, supported by help resources.

OpenPlato features versioning, multilingual support and thematic organization, hosting a comprehensive catalogue of curated and tagged resources compliant with FAIR standards.

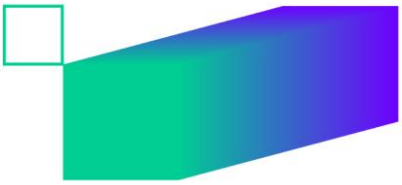
2.3.2 OpenPlato's digital Ecosystem

To date, OpenAIRE's network of National Open Access Desks (NOADs) and affiliated trainers have organised over 800 training events, involving 30,000+ learners and 1,200 trainers. OpenPlato consolidates these efforts into a structured and permanent infrastructure that facilitates continued delivery, reuse, and scaling. As new European and international projects develop content under Open Science and FAIR policies, OpenPlato provides a reliable platform for training material deposit, multilingual dissemination, and federation into EOSC's training and skills landscape.

In conclusion, OpenPlato represents a long-term, policy-aligned solution for addressing the training needs of Europe's evolving research ecosystem. By combining robust technical foundations with inclusive governance and a clear sustainability strategy, the platform positions itself as a core element of Europe's Open Science capacity-building infrastructure. It is designed to be reused, extended, and federated, ensuring its relevance far beyond the timeline of any single funding cycle.

2.3.3 Additional Tools for Digital Material production

To support the development of high-quality, interactive, and pedagogically robust digital learning materials, OpenPlato leverages a range of authoring tools and functionalities enabled by the Moodle ecosystem, to facilitate the creation, repurposing, and enhancement of educational content, ensuring both accessibility and long-term relevance across diverse training contexts.



OpenPlato integrates third-party authoring tools such as Articulate 360, which allows for the development of interactive learning objects, including scenario-based learning modules, knowledge checks, and embedded quizzes as well as transformation of Microsoft PowerPoint presentations into SCORM-compliant digital courses. Such integration empowers trainers to convert existing resources into engaging digital formats with minimal additional workload, enhancing the reusability and sustainability of training outputs.

Additionally, OpenPlato's compatibility with educational standards (e.g. SCORM, xAPI) ensures that content created using external tools can be embedded directly into courses while retaining interactivity, user tracking, and interoperability with other institutional learning environments.

Moodle features embedded H5P tools for interactive video and quizzes, glossary and database activities, and feedback modules enable trainers to construct personalised and dynamic learning experiences. These tools are essential in maintaining learner engagement, particularly in self-paced and asynchronous courses.

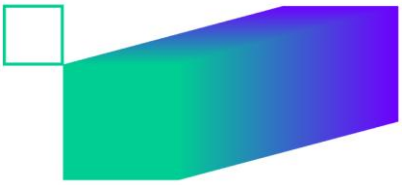
OpenPlato encourages the reuse and federation of content across institutional and thematic communities. The platform's metadata-driven catalogue, enriched with multilingual and localisation fields, allows contributors to share content that is findable, adaptable, and aligned with FAIR principles.

OpenPlato's governance model underpins the platform's long-term sustainability. A dedicated annual financial commitment from OpenAIRE AMKE ensures that the platform remains operational and evolves in line with community feedback and technological advancements. This funding secures ongoing system upgrades, technical support, and user training services, positioning OpenPlato as a future-proof component of the EOSC training landscape.

OpenPlato supports the creation of structured learning paths tailored to various roles in the research ecosystem—researchers, data stewards, policymakers, and trainers. These paths include assessments, digital badges, and certificates to motivate learners and recognize skill development. Each course also features discussion forums that encourage peer interaction, knowledge exchange, and collaborative learning, fostering active learning communities.

The platform hosts live and blended training events, allowing institutions to co-develop and deliver courses using shared workspaces and resource libraries. This makes OpenPlato a key tool for engagement and collaboration among European Open Science stakeholders, while supporting scalable and standards-compliant content development.

By combining external authoring tools, Moodle features, and its federated design, OpenPlato offers a robust and sustainable framework for managing and delivering digital training that meets institutional and EU-level Open Science needs.



2.3.4 Hosting and Maintenance by Third Parties

OpenPlato is hosted in a secure European data center compliant with EU data protection regulations, offering high availability, disaster recovery, and continuous monitoring to ensure platform reliability and user data integrity. Infrastructure services such as server maintenance, storage, and load balancing are managed by a trusted institutional partner with expertise in research infrastructure.

Third-party providers specializing in open-source educational technologies handle platform updates, bug fixes, and security patches, maintaining both staging and production environments to ensure smooth rollouts. UI/UX enhancements and responsive design improvements follow agile development roadmaps, supported by continuous testing and analytics for ongoing platform refinement.

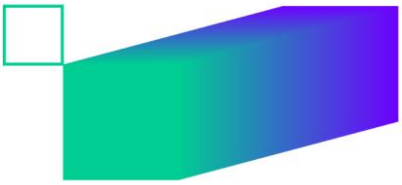
This multi-layered maintenance model ensures OpenPlato remains stable, scalable, and responsive to the evolving needs of the European Open Science community. Professional hosting and long-term service agreements guarantee operational continuity within the EOSC and OpenAIRE ecosystem.

For content sustainability, a decentralized approach empowers course authors and thematic leads to manage updates. A full mapping of PATTERN training materials—PowerPoints, PDFs, and external tools—has been completed, aiding version control and review.An expert editorial board oversees content quality, alignment with EU frameworks, and supports reuse through structured metadata and modular design. This ensures educational integrity and coherence across the platform's learning offerings.

Course authors are encouraged to adopt lightweight sustainability strategies such as routine content audits and strategic reuse of core materials. They are responsible for identifying and fixing outdated references or broken links, particularly in courses that use dynamic resources like evolving case studies. Thematic leaders are further advised to document external tools, track their availability, and verify licensing and citation requirements. A sustainability framework currently in development will formalize these practices, promoting consistency and forward compatibility across all PATTERN training content.

Not all courses require the same degree of maintenance. Foundational materials may remain current with minimal updates, while more interactive or tool-based modules may require ongoing revision. Selective reuse, especially in the context of Problem-Based Learning (PBL), allows course authors to repurpose relevant content while maintaining clarity on attribution and usage rights. OpenPlato supports both metadata and content reuse: metadata is made available under a CC0 license to encourage open redistribution, while course content reuse is governed by permissions defined by resource providers.

In conclusion, the technical and content sustainability of OpenPlato is secured through an integrated strategy that combines robust infrastructure, expert partnerships, and decentralized content stewardship. As a central training platform within the OpenAIRE and EOSC ecosystems, OpenPlato is well-positioned to support long-term, scalable, and FAIR-aligned education in Open Science.



2.3.5 PATTERN Open Studio Outcomes: Advancing OpenPlato's Sustainability

The insights gathered during the PATTERN Open Studio in Braga and 1st and 2nd online Open Studios organized by ESF in the context of WP4 activities offered valuable perspectives on OpenPlato's long-term sustainability. These sessions brought to light key considerations across pedagogical, technical, and financial domains, reflecting the diverse priorities of stakeholders involved in the PATTERN initiative.

2.3.6 Financial Sustainability and Institutional Buy-In

Financial sustainability was identified as a critical challenge, especially given that many universities already operate their own LMS and may hesitate to support perceived duplication. Although OpenPlato is centrally maintained by OpenAIRE and does not impose direct financial burdens on PATTERN partners, the long-term sustainability of the platform will benefit from diversified funding strategies.

Proposed funding models included:

- Voluntary subscriptions or sponsorships, where institutions can support specific courses in exchange for visibility.
- A crowdfunding approach to involve community stakeholders in sustaining shared resources.
- Adoption of the "Open Library of Humanities" model, in which widespread access is underpinned by selective financial contributions from a few institutions.
- Institutional partnerships, where universities co-develop and maintain content, enhancing their ownership and engagement with the platform.

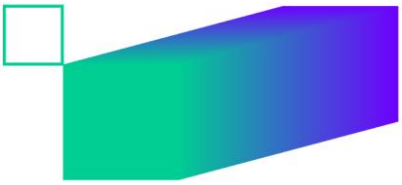
Ultimately, success in securing financial support was seen to depend on how well OpenPlato demonstrates its relevance, quality, and value to higher education institutions and research communities.

2.3.7 OpenPlato's Technical Sustainability and Risk Mitigation

From a technical perspective, the studios reaffirmed OpenAIRE's role as the maintainer of OpenPlato but also pointed to the need for clarified governance mechanisms to ensure continuous updates, security patches, and community stewardship. Concerns were expressed over:

- Hosting clarity and infrastructure dependencies.
- Risks of external tool deprecation or changes to interoperability protocols
- The importance of sustaining an open-source development model with ongoing community contributions.

To address these, several risk mitigation strategies were proposed:



- Stronger integration with EOSC resources, leveraging Zenodo for metadata management and PIDs.
- Creation of national working groups to take joint responsibility for content curation and platform enhancement.
- Encouraging community contributions of time and expertise, particularly in maintaining the relevance and accuracy of training materials.
- The need for URL stability, regular updates, and clearly documented content ownership was emphasized to enhance user trust and encourage resource reuse over time.

The PATTERN Open Studios underscored the necessity of a multi-dimensional sustainability strategy for OpenPlato—one that integrates pedagogical flexibility, financial innovation, and technical robustness. By aligning with existing educational infrastructures, embracing open-source community practices, and exploring diversified funding pathways, OpenPlato can continue to evolve as a cornerstone for open, accessible, and reusable learning—both within PATTERN and the broader Open Science landscape.

2.3.8 Estimated costs and sources of funding

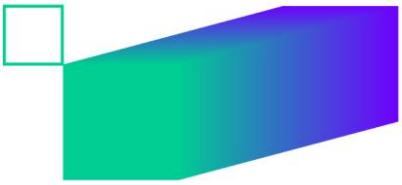
Universities have their own Learning Management System and pedagogical digital tool and will continue to support them from their core budget since it is a critical infrastructure. Moodle is widely used and supported among European higher education organizations. They are not willing to pay for duplicate ones such as the OpenPlato Moodle platform. However, OpenPlato does not need financial support from other partners than OpenAIRE which will keep it open after the end of the PATTERN Grant.

2.4 PATTERN Projects

2.4.1 Key Features of the PATTERN Projects Platform

The PATTERN Projects platform supports collaborative, project-based learning tailored to Open RRI, with key features designed to empower both learners and educators:

- Customizable project templates that help teachers guide learners in structuring goals, documenting progress, and reflecting on outcomes.
- Mentor matching and peer supervision tools to support learning through guided collaboration.
- AI-powered recommendations to connect users with relevant projects, peers, and mentors.
- Geolocation features to map activities and promote local collaboration.
- Integrated notifications to keep users informed of updates, feedback, and milestones.
- Digital portfolios aligned with the SDGs to highlight individual and collective impact.



Hosted securely on EU-compliant Azure servers in France, the platform supports data protection and technical sustainability for the PATTERN learning community.

2.4.2 An open-source strategy to improve sustainability

The PATTERN Projects platform is a specific instance of PROJECTS, an open-source[1] web platform created by Learning Planet Institute. It is released under a creative commons licence (CC-BY-NC-SA 4.0).

By being open-source, the platform ensures that its code is transparent, adaptable, and continuously improved by a global community of developers. This collaborative approach enables long-term technical sustainability, as the platform can evolve without being tied to proprietary systems or vendor lock-in. Additionally, the platform's release under the Creative Commons (CC-BY-NC-SA 4.0) license ensures that it remains freely available for non-commercial use and can be modified or shared, promoting its use in diverse educational contexts and ensuring its accessibility for years to come.

Partners chose this specific non-commercial license for the PATTERN Projects platform to ensure its accessibility to educational and non-profit users. At the same time, this license allows us to generate revenue by offering the platform as a SaaS or licensing it to commercial entities, ensuring the platform's financial sustainability without compromising its core mission of open access.

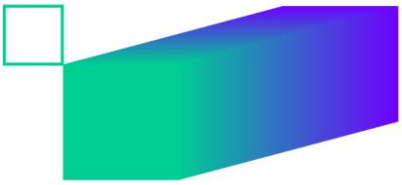
2.4.3 Technical architecture

The technical stack leverages modern web technologies across multiple layers:

- **Frontend:** Vue.js
- **Backend:** Python, Django, Celery, Redis
- **Authentication & Security:** Keycloak
- **Search & Indexing:** OpenSearch
- **Storage:** Azure Blob Storage, PostgreSQL
- **Real-time Collaboration:** Hocus Pocus
- **Maps:** OpenStreetMap
- **AI Integration:** Mistral AI
- **Analytics & Monitoring:** Mixpanel
- **Testing & QA:** Playwright (for end-to-end testing)

Most of these technologies are open-source, but LPI is also leveraging commercial services: Mixpanel for analytics, Microsoft Azure for hosting and Mistral Artificial Intelligence (AI) for text summarization and content recommendations (commercial offering, though based on open models).

[1] Source code and technical documentation: https://github.com/CyberCRI/projects-frontend



All these technologies are widely used and chosen for their ease of maintenance.

By primarily relying on state-of-the-art open-source technologies, partners ensure the long-term sustainability of their tech stack.

2.4.4 Platform hosting

The PATTERN projects platform is hosted on Microsoft Azure servers located in France, ensuring compliance with EU data protection regulations and providing a secure, high-availability environment. This setup supports technical sustainability through robust performance, data integrity, and disaster recovery capabilities. The platform is built using Kubernetes container orchestration technology, which allows for seamless portability. This architecture ensures that, if needed, the platform can be migrated to another cloud provider with minimal disruption, preserving continuity and flexibility over the long term.

2.4.5 Long term maintenance, safety and security

For long-term maintenance, safety, and security, LPI prioritizes robust development practices to ensure the platform's reliability and protection. LPI implements unit testing and end-to-end (E2E) testing to catch bugs early and maintain high-quality code, ensuring the platform performs as expected in real-world scenarios. Additionally, LPI focuses on security best practices by regularly updating dependencies, conducting security audits, and applying necessary patches. The development process follows an iterative agile approach, with two-week sprints to ensure continuous improvement and quick adaptation to new needs or issues. This collaborative and agile approach not only strengthens the platform's security and performance over time but also fosters a long-term, community-driven commitment to its growth and stability. To ensure sustainable development, LPI actively engages with partner university developers, providing opportunities for them to contribute to the platform's evolution and maintenance.

2.4.6 Estimated costs

LPI has developed a preliminary estimate of the technical costs required to sustain the platform after the PATTERN grant ends, outlined across three scenarios. Small costs such as domain registration and online tools licences are aggregated under Servers & Cloud Services.

The three levels of platform usage are as follows:

1. Static projects and documents only
2. New students and teachers can still interact with the platforms
3. LPI's platforms keep improving with new features and reach a growing audience

	Servers & Cloud services	Technical support	Functional support	New features	Yearly Cost
Level 1	30k€ / year overall For PATTERN, 3k€/year	DevOps specialist 2% of his time for PATTERN	No support	None	3k€
Level 2	30k€ / year overall For PATTERN, 5k€/year	DevOps specialist 15% of his time for PATTERN	Junior employee 20% of her time	None	20k€
Level 3	30k€ / year overall For PATTERN, 8k€/year	DevOps specialist 25% of his time for PATTERN	Junior employee 50% of her time	Senior Full stack Developer 80k€	120k€

Figure 1 - Funding needs levels by domain for three levels of platform sustainability

2.4.7 Potential sources of funding

Potential solutions were explored during dedicated sessions of the second cycle of Open Studio in Braga, through participatory workshops.

Many ideas were explored to secure funding for the platforms, such as:

- Crowdfunding or offering courses
- Sponsorship opportunities
- Pilots may direct additional students to Projects after the project's conclusion, for a fee
- Leveraging the EOSC Node ecosystem
- Integrating the platform into curricula

It's important to note that universities are unlikely to invest significant amounts unless the **courses are integrated into their existing curriculum**.

To support long-term sustainability, participants suggested introducing membership models or access fees, supported by mutual agreements between partners to maintain the platforms post-project. Company sponsorships and a cooperative funding model, inspired by the Open Library of Humanities, were proposed—where many benefit but only some contribute financially. Expanding use beyond the PATTERN consortium could broaden support, and sponsoring specific trainings (e.g. with university logos) was seen as a practical, visible way to attract institutional backing.

An annual voluntary Subscription / Membership from PATTERN partners is the strongest possibility.

Expanding progressively the partners will improve the long-term sustainability, financially and technically long after the end of the grant.

In addition to the membership contributions from PATTERN partners which, as rightfully stated, remain the strongest prospect for ensuring the financial

sustainability of the platform, the Consortium is actively pursuing a twofold external engagement strategy. Specifically, efforts are being made to attract external academic actors and related stakeholders to join the initiative. As part of this strategy, a draft Sponsorship Agreement has been developed (see Annex 1). This Agreement is designed to offer various levels of sponsorship, providing visibility and collaborative opportunities for sponsors while contributing to the operational and development costs of the platform. Through this mechanism, PATTERN aims to gradually broaden its network of supporters and secure complementary funding streams to reinforce the long-term viability of the platform and its educational offerings.

2.4.8 PROJECTS platform current roadmap

The PROJECTS platform development is already supported by several grants and partners, including a French national research funding agency (ANR) grant, a Regional Parisian grant, private foundations and several European universities outside the scope of the PATTERN project. As an open-source project, the future features development is prioritized with the help of all the research and pedagogical communities involved.

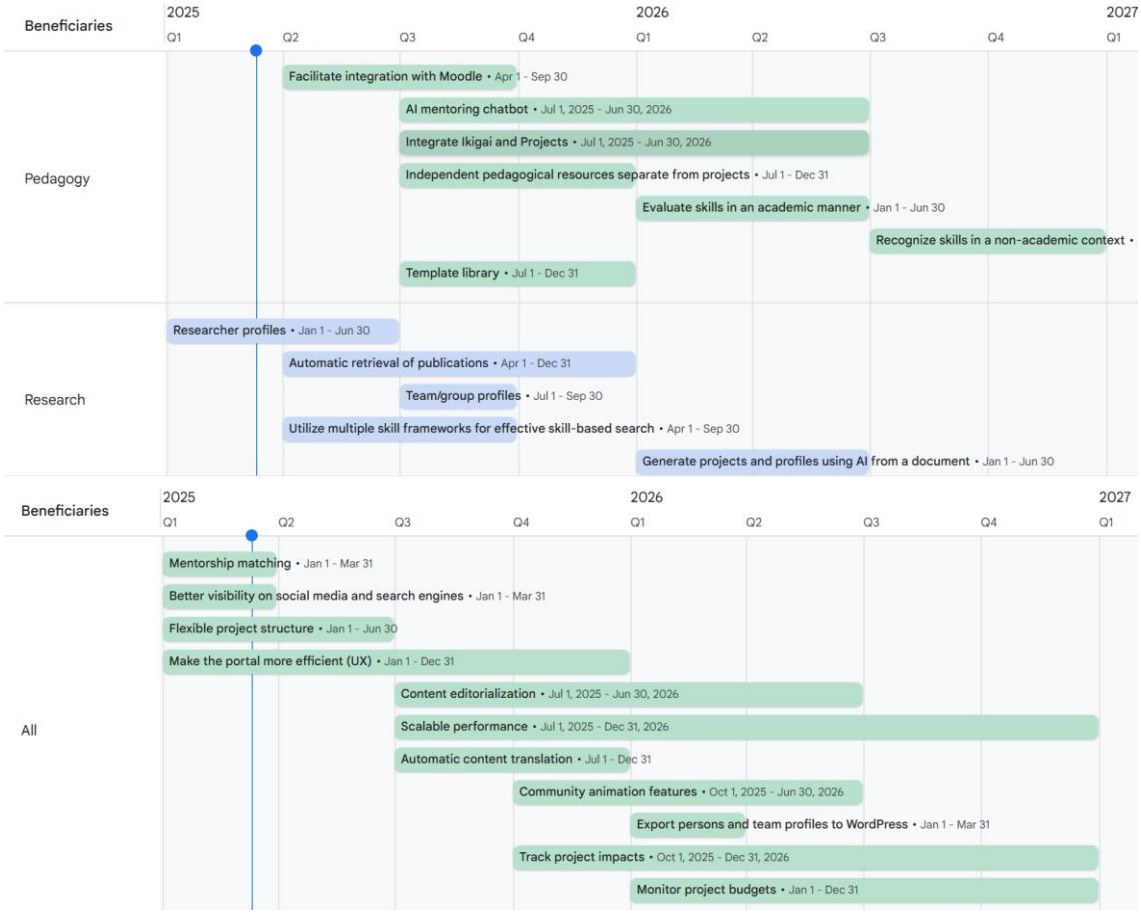
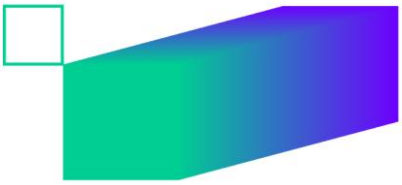


Figure 2 - Projects platform development roadmap 2025-2027



All developments are shared with all Projects Platform partners. Some features financed by other partners will directly benefit the PATTERN community, such as flexible structure, AI extraction of researchers skills and profiles, content editorialization and advanced search through natural language leveraging AI Large Language Models and Transformers.

Developments of new features are grouped in three main categories:

- Pedagogy: these features add value to educators and teachers or help learners build skills more efficiently. The development team will focus on advanced AI features such as AI mentoring and skills evaluation
- Research: the Projects platform will integrate open-source developments directly useful to researchers, such as skills AI extraction and analysis from publications and advanced research features.
- All: generic, multi-purpose features such as community animation, improved performances, scalability and security and easy data export.

2.5 PATTERN login and connection between Projects and OpenPlato

LPI and OpenAIRE partners have created a **common login system, integrating both platforms to streamline the user experience**.

2.5.1 Authentication system operation

Authentication is managed by the Projects platform, with accounts and passwords stored on Keycloak, a highly scalable open-source account management system. On OpenPlato, users can log in using their Projects credentials, which redirects them to a login page. If the user is new, they are directed to an account creation form. Once the account is created, single sign-on (SSO) is enabled across both platforms.

In summary, Projects acts as the identity provider, while OpenPlato serves as the service provider.

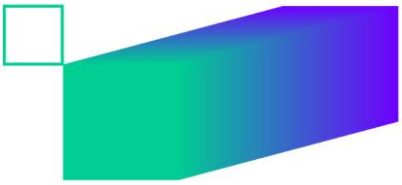
2.5.2 Estimated maintenance costs

Maintaining this service incurs minimal costs as long as both platforms remain technically supported. Learning Planet Institute and Open AIRE have committed to providing at least basic maintenance for the next five years.

2.6 General overview of the technical sustainability

2.6.1 Who will maintain the platforms technically?

For both Projects and OpenPlato, internal teams (LPI Digital Team for Projects and OpenAIRE for OpenPlato) will assume technical responsibility. The PATTERN leaders



need to clearly define governance structures and responsibilities, particularly for OpenPlato, and to ensure ongoing updates and platform security.

As stated before, LPI has defined 3 levels of accessibility of the platform (static data stays accessible, courses can still be followed, new content and classes can be added); the risks and costs rise with each level. The incurring cost rise with each level of the long-term ambition of their sustainability strategy.

2.6.2 What are the long-term sustainability risks?

Identified risks include unclear long-term hosting plans, limited accessibility of platforms and content, and dependency on external tools or frameworks. Security risks will rise with time if the platforms are not maintained technically by IT experts. Data preservation and interoperability (especially between PATTERN platforms and others like EOSC) is critical. For OpenPlato, potential misalignment with other initiatives or data models is seen as a threat by PATTERN pilots. Projects and OpenPlato internal teams will try to integrate PATTERN outputs into established open-access directories, like EOSC, and to foster a user and contributor community. Partners will explore creating national working groups, Git repositories for platform content, using ZENODO (which create a long-lasting DOI) and aligning with broader European infrastructure standards (e.g. OpenAIRE, FAIR) to promote sustainability and openness.

Creating a living open-source community to maintain and develop the code of Projects would be useful but a core technical team is needed, that will have to be funded.

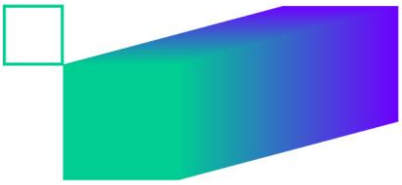
The group emphasized the importance of making the platforms accessible, ensuring content longevity, and building networks of reuse (e.g. with other European projects and national initiatives). Interoperability, discoverability, and content reuse (e.g., via metadata standards) are important for ensuring long-term technical sustainability.

2.6.3 Platforms financial sustainability

Sustainability funding beyond the project lifecycle remains a key concern. Funding needs to be secured to maintain core platforms and website infrastructure for at least 5 years post-project. Partners will strive to create a network of members who pay a voluntary fee to sustain the platforms as their preferred strategy.

Reaching level 2 of their sustainability strategy would require 20k€ a year, an amount that can easily be raised if all consortium members agree to contribute.

Reaching level 3 of their sustainability strategy (120k€/year) will require enrolling a fair number of other higher education partners and / or winning new grants to support the development of new features.



3 Courses sustainability

3.1 Introduction to courses sustainability

The sustainability of PATTERN training courses relies on a clear, flexible strategy that enables long-term use, local adaptation, and regular updates. From the start, courses are designed for reuse—using modular formats, open licensing, and train-the-trainer (TtT) materials to build institutional capacity.

A shared responsibility model supports content maintenance: local teams adapt and deliver training, the PATTERN core team ensures quality, and thematic partners update content in their areas of expertise (e.g. FAIR RDM, Open Access). To keep materials relevant, updates are planned during a second learning cycle, aligned with evolving policies and research practices.

Good practices like using real-world case studies, flipped classrooms, and multimedia scenarios are embedded to boost engagement and adaptability. This combined approach ensures that PATTERN courses remain useful, usable, and up-to-date across institutions and over time.

3.1.1 Pedagogical Sustainability and Integration in OpenPlato LMS

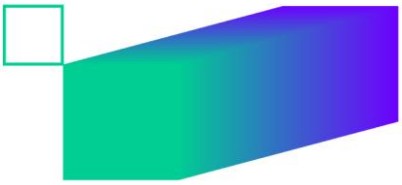
A central theme is the importance of interoperability with existing teaching systems. Participants emphasized the need for OpenPlato to align with institutional LMS and curricula, ensuring it supports structured learning pathways rather than functioning solely as a repository of self-paced content. Integration with EOSC's AAI was highlighted as a critical feature to enhance user accessibility and cross-platform interoperability.

The reusability of educational content emerged as another major concern. Stakeholders advocated for course materials to be made available in formats such as SCORM, PDF, and H5P—ensuring compatibility with other platforms and long-term usability. Hosting of materials on trusted repositories like Zenodo, with persistent identifiers and proper licensing, was seen as essential for maximizing discoverability and adherence to FAIR principles.

Suggestions to improve pedagogical support included:

- Translation of training materials to enhance accessibility across linguistic communities.
- Incorporation of structured case studies in modular and adaptable formats.
- Development of features such as student self-assessment, and tools to better support neurodiverse learners.
- Exploration of a chatbot to guide users in navigating OpenPlato content and broader PATTERN resources.

However, the sessions also raised concerns around the platform's current orientation toward asynchronous, self-paced learning. Usability testing and feedback loops were proposed to ensure OpenPlato evolves into a more comprehensive educational tool that could support hybrid or structured learning models.



3.2 Citizen Science

AU has developed a robust Citizen Science training module grounded in a blended learning model. The content includes two presentations and fourteen case study descriptions that support an engaging, 1–1.5 hour live format focused on community engagement and participatory research. In Cycle 1, AU successfully piloted flipped classroom sessions combining pre-distributed materials with active case-based discussions. In addition, Citizen science modules have been fully integrated into PATTERN's digital ecosystem through the e learning platforms. More specifically on the Projects Platform, the 14 structured case studies were hosted and used as core study materials for PBL activities. Each case study guided learners in critically evaluating key aspects such as purpose, methods, participant engagement, ethical considerations, and outcomes. Additionally, OpenPlato is currently developing a dedicated Train-the-Trainer guide linked to the existing topics. To support continuous improvement, training analytics and evaluation tools were deployed (see D3.3[2]), tracking participant interactions and gathering feedback on engagement levels and content relevance.

3.2.1 Content maintenance

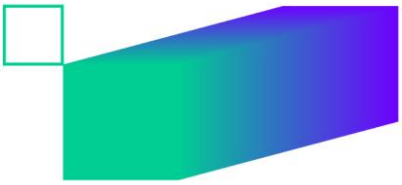
AU will maintain the Citizen Science materials and continue refining them through new pilots in diverse contexts, such as the Circle U. Summer School and a municipality-based workshop in Denmark. A TtT Guide is currently in development and will be published by early summer 2025 to support institutional facilitators. Rather than developing standalone self-paced modules, AU will embed structured activities into OpenPlato and Projects, using a blended model that ensures engagement through live activation. Curriculum mapping will also highlight how Citizen Science links with other themes like Science Communication and Research Integrity, promoting content reuse and skill transfer.

3.2.2 Case studies maintenance

Building on the success of case-based training in Cycle 1, AU will expand its set of Citizen Science study cases by incorporating examples tailored to the profiles of new participants. These cases will serve as the foundation for group discussion and collaborative exercises within live workshops and Projects-based activities. All study cases will be mapped and reviewed regularly to ensure alignment with transferable competencies and thematic coherence across the PATTERN curriculum.

3.3 Science Communication

[2] doi.org/ 10.5281/zenodo.15209490



SISSA, with the support of RBI, has developed a 15-hour course on *Science Communication* consisting of five core modules covering a general introduction and four specific topics in line with Grant Agreement: media writing, interviews, social media and communication with policymakers. The content was designed for trainers, including for each module: a PowerPoint presentation, a script that could be used as a potential reference from trainers and full guidelines including description of the training and practical activities, schedule and bibliography. Examples are included in each presentation and can be customised by each trainer. Starting from this material an Articulate version (i.e. digital material course creator tool) of the material for trainers has been developed and is about to be finalised for upload on OpenPlato.

3.3.1 Content maintenance

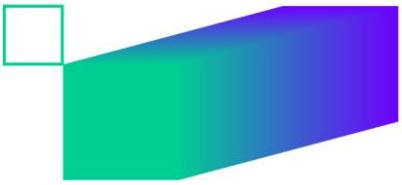
SISSA, in partnership with AU, will lead the maintenance and further development of the Science Communication training content. Some updates have already been implemented since the first version of the material was released last fall (first pilot training event November 2024). The future plan includes analysing the feedback from the evaluation collected so far, discussing potential changes to the material with other pilot institutions including a reduction of the number of modules. The possibility of transforming the selected content into self-paced modules for OpenPlato and the development of project-based activities for the Projects platform will also be discussed. Material updates will follow a phased timeline, starting after May 2025, with final structure ready by October. A clearer division will be made between trainer resources and learner-facing content.

3.3.2 Case studies maintenance

The course has provided examples and case studies through the lectures. Moreover, students have been using their own research projects to practice different communication skills, from writing press releases to being interviewed, using social media or giving short talks. SISSA, together with AU and with the help of LPI and OpenAire, will explore the reuse of student-generated examples from Cycle 1 to create mini-projects and case-based learning content for the Projects platform. Drawing inspiration from the DANS' FAIR RDM model, SISSA will structure each study case with context, objectives, and engagement prompts. This transformation will not only enrich the learner experience but also contribute to the visibility of science communication as a core pillar within Open Scholarly Communication.

3.4 Dissemination and Exploitation of research results

This training course has been developed by APRE and LOBA, with the support of three pilot organizations (UniSR, SISSA and IZTECH). It designed to enhance researchers' understanding of dissemination and exploitation (D&E) as essential components in maximising the impact of research projects. With a specific focus on Horizon Europe proposals and projects, the course equips participants with the tools and knowledge



needed to develop effective communication, dissemination and exploitation (CDE) strategies. Through practical case studies and interactive learning based on real Horizon Europe proposal excerpts, learners are guided on how to increase project visibility, leverage social media, and pitch their research outcomes to broader audiences.

While the courses primarily target doctoral and postdoctoral researchers, they are also relevant for early-career researchers with an interest in D&E or active roles within funded research projects. Additionally, Research Managers and research support staff dealing with EU projects at any level (i.e. Universities' Grant Offices) might benefit from this training too.

3.4.1 Content maintenance

To ensure the sustainability of the training content beyond the lifetime of the project and, potentially, of Horizon Europe, APRE is currently revising and updating the course for the second learning cycle. This involves decoupling the core D&E concepts from Horizon Europe-specific regulations and language, making the course applicable and relevant in a broader and more durable context. Horizon Europe will continue to be used as a real-life scenario and a source of examples, but no longer as the sole framework structuring the content.

Furthermore, the course is being restructured to strengthen its modularity: four independent but complementary modules will allow flexible use, adaptation, and targeted updates.

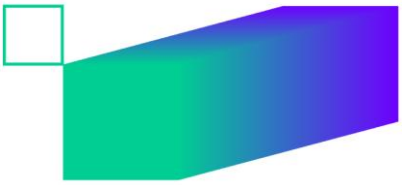
Given APRE's institutional mission and extensive experience in European project design and training, including on D&E, future content updates can possibly be integrated as new FP10 emerge, ensuring continued relevance and applicability, while maintaining a strong and reliable framework of reference for all researchers within and beyond Europe.

3.4.2 Case studies maintenance

The current case studies are based on Horizon Europe proposals. These will be reviewed and updated by APRE as part of its routine work in project development and support. As soon as the next EU Framework Programme becomes operational and begins producing relevant outcomes, the course's examples can be refreshed accordingly. This dynamic approach to content maintenance has the potential to ensure that case studies remain up to date and reflective of the evolving European R&I landscape.

3.5 Gender, Non-discrimination and inclusion (GNI)

The GNI module (structured by 6 modules in general) has been led by UniSR and ESF, and its content has been developed by both thematic leaders and the LPI, with the support from teachers from Data and Gender Observatory, Z-Inspection and FORRT.



UniSR and the LPI created a main project in the PATTERN Projects Platform by which registration links are available for UniSR and external participants. This course is mandatory for the Université Paris Cité-LPI MSc year 2 students and got the accreditation from the UP Cité with 3 ECTS.

3.5.1 Content maintenance

UniSR, as thematic leaders in the design and implementation of training courses on GNI, began by enriching the courses already integrated into their PhD educational offering. Building upon this foundation, UniSR expanded the courses to meet PATTERN objectives, while ensuring they remained relevant and impactful for PhD students.

The sustainability of the GNI training courses beyond the first learning cycle and possibly beyond PATTERN's lifespan, will be guaranteed through their continued integration into the UniSR doctoral training offer. These courses will undergo regular review, updating and approval processes. By so doing, the enhanced GNI training modules will remain highly valuable not only for PhD students but also for the broader PATTERN scientific community, remaining aligned with evolving academic needs and maintaining relevance.

3.5.2 Case studies maintenance

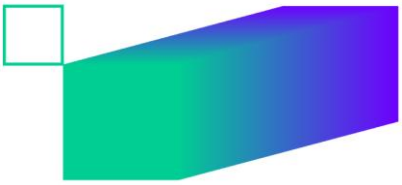
The case studies developed by UniSR have been designed to be integrated effectively into the core content of the GNI training modules. Consequently, they will be subject to the same evaluation and approval process, ensuring their continued relevance and keeping them up-to-date.

3.6 Mental Health Leadership

SciLink has developed a modular training series on *Mental Health Leadership* tailored to early career researchers, focusing on emotional resilience, leadership development, mentor-mentee relationships, and academic networking. The training adopts a flipped classroom approach and includes both in-person and online components. Twelve webinars are planned, open to REMO audiences, and all sessions will be recorded and shared as Open Educational Resources (OER) via OpenPlato and the PATTERN platform. Training content is enriched with participant-submitted scenarios to stimulate reflective, problem-based learning.

3.6.1 Content maintenance

SciLink will take the lead in maintaining and continuously updating the Mental Health Leadership training materials. Trainers are expected to refine their modules based on post-session feedback and evolving needs from participants. A shared responsibility model will be implemented, where SciLink manages the thematic content, the



central PATTERN team oversees pedagogical alignment and platform integration, and partner organizations may contribute localized examples or translations. Updates will be tracked through the Projects platform and coordinated via admin access and structured feedback loops.

3.6.2 Case studies maintenance

SciLink will integrate anonymized, real-life study cases gathered through structured pre-training submissions from participants. These cases will be used to initiate discussion in both webinars and face-to-face trainings. Each case will be linked to a sub-project within the Projects platform, enabling ongoing peer reflection and collaborative commentary. This ensures that the training remains grounded in authentic challenges and supports context-specific learning—particularly around leadership dilemmas, academic isolation, and team communication in mental health-sensitive research environments.

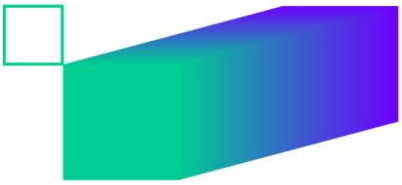
3.7 Open Access

UMinho, jointly with OpenAIRE, HEAL-Link, UDebrecen & RBI, have developed a comprehensive set of courses to promote Open Access (OA) topic and cover the gaps identified, mapped and assessed previously in WP1. This resulted in 7 courses: 1) Open Access publishing: overcoming the challenges and busting the myths (2h self-paced course); 2) Trusted publishers for my research: decoding good practices and overcoming predatory publishers (2h face-to-face); 3) Empowering researchers: retaining copyright and maximizing your impact in Open Access Publishing (1h30 webinar or 2h face to face session) ; 4) Meeting funder requirements: navigating Open Access Publishing (2h face-to-face); 5) Mastering Open Peer Review: Evaluating and Engaging in Transparent Scholarly Discourse (1h self-paced); 6) Integrating Open Access Publishing into my research: putting into practice (project-based learning approach); and 7) Designing my research project Open Access strategy: meeting funder requirements (PBL approach).

The courses have been designed in co-creation with the pilot institutions and the results from the first testing phase have been reflected to improve the final content. Also, a very flexible approach has been adopted, allowing for selection of different delivery modes (e.g. the Empowering researchers course can either be a webinar or a face-to-face session), translations to the pilot institution's languages, and incorporation of regional/ national content (e.g., national laws). Alongside the set of materials, there is also guidance for trainers on how to customize and deliver each course.

3.7.1 Content maintenance

UMinho will lead the ongoing development and necessary updates of both the self-paced courses and the guidance for trainers. This maintenance will be carried out within the scope of the OpenPlato platform's course portfolio and will be under the



supervision of the OpenPlato editorial team. All the course materials were created using reliable tools and considering the sustainability of the content itself, in order to require minimal updating needs.

Specifically, courses developed using the PBL methodology, supported by the LPI Projects platform, will be maintained as part of the set of courses available to trainers on OpenPlato. This ensures that the pedagogical approaches and tools remain current and effective for ongoing training needs.

As a leading OpenAIRE training partner, UMinho is committed to the continuous improvement and relevance of these educational resources. This commitment includes regular reviews and updates of course content, the incorporation of feedback from trainers and trainees, and alignment with emerging best practices in Open Science training and research.

3.7.2 Case studies maintenance

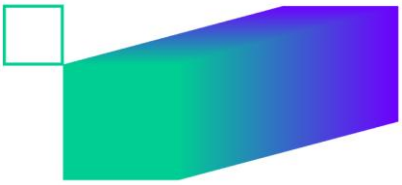
UMinho, in collaboration with OpenAIRE, will oversee the maintenance and ongoing updating of case studies that illustrate the application of OpenAIRE services in various contexts. This effort will be supported by contributions from OpenAIRE AMKE member organizations that are actively involved in the Training and Support Standing Committee and related working groups.

The maintenance strategy is integrated into OpenAIRE's internal organizational structure, drawing on the expertise of the OpenPlato editorial team and the Training and Support SC. This collaborative approach ensures that the case studies remain current, relevant and aligned with the evolving practices and needs of the Open Science community.

By systematically updating these case studies, the aim is to provide valuable information on the practical implementation of OpenAIRE services, thereby supporting the adoption and advancement of Open Science principles in diverse research environments.

3.8 FAIR Research Data Management

DANS has developed a comprehensive, modular training suite on FAIR RDM, consisting of five core sessions (2.5 hours each) delivered face-to-face. Each session includes multiple PowerPoint presentations, exercises, and a TtT component, along with a pre-course document and a set of eight PBL assignments. Additionally, a self-paced version of Session 1, designed by DANS, has been launched as a prototype, offering a condensed digital entry point. The full course suite is complemented by recorded sessions, gamified elements, and practical Data Management Plan (DMP) exercises supported by OpenAIRE's team. In current versions Projects e learning platform host two versions of FAIR RDM digital training material one for learners and one for other Trainers TtT. Both versions include downloadable material in edible versions.



3.8.1 Content maintenance

DANS will lead the continued development of the self-paced course series, aiming to convert all five sessions into accessible e-learning modules post-summer 2025. These modules will be hosted on OpenPlato and will support flipped learning models, enabling learners to engage with materials before participating in live workshops or bootcamps. OpenAIRE will ensure alignment with KPIs, integrating these courses into future the Train-the-Trainer bootcamps and Data Steward Bootcamp taking place in 2025 & 2026. To address known access issues and engagement gaps, the team will enhance platform interoperability, offer editable Articulate files for local reuse, and establish feedback loops for continuous improvement.

3.8.2 Case studies maintenance

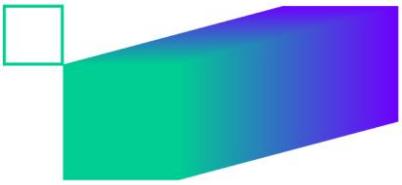
Study cases are central to the FAIR RDM approach, with DANS & OpenAIRE plus affiliates network jointly curating a diverse set of project-based assignments focused on realistic research scenarios. These cases cover data sharing, licensing, and privacy challenges, and are used in both self-paced modules and interactive breakout discussions. Participants are encouraged to engage with these scenarios via the Projects platform, where they provide reflections and complete DMP exercises collaboratively. Feedback and comments collected during pilot use will be transformed into new study cases or integrated into gamified elements such as quizzes and peer-review tasks. Future iterations will emphasize cultural adaptability and modularity to serve both researchers and data professionals across contexts.

3.9 Research Integrity

The Research Integrity module, conceptualised and produced by EARMA and led by AU and UniSR, is built on a foundational set of five structured PowerPoint presentations covering key concepts in responsible research and innovation, including good scientific practices and ethical decision-making. While these materials have served primarily as face-to-face teaching aids. The aim is to make these resources more interactive, accessible, and suitable for both self-paced learning and trainer-facilitated sessions through OpenPlato and the Projects platform.

3.9.1 Content maintenance

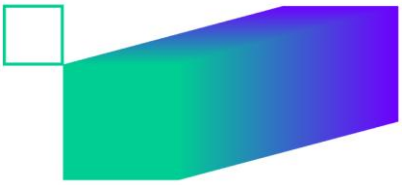
Thematic Leaders (EARMA & AU) in collaboration with pilot organizations will jointly take responsibility for maintaining and expanding the Research Integrity training. EARMA will support with a structured monitoring of new and relevant resources, references and documents to be added, especially taking into considerations exploring synergies between other project and programmes EARMA is involved in: iRECs project developing trainings and resources, including a Train-the-Trainer approach to research ethics and emerging technologies, RE4GREEN designing materials on research ethics and the green transition, the NERQ network, the



Embassy of Good Science relevant new materials and the new EARMA Professional Development programmes for research managers. AU focuses on platform delivery and potential integration with related themes such as Citizen Science and Science Communication.

3.9.2 Case studies maintenance

To increase learner engagement and relevance, thematic leaders will support the integration of these materials on the Projects platform, enabling peer discussions and comment-based reflection. This approach aims to shift learners from passive understanding to applied reasoning, aligning closely with PATTERN's broader goals of experiential learning and cross-thematic coherence.



4 Institutional support

The long-term sustainability and impact of PATTERN's ORRI training ecosystem relies heavily on the capacity and commitment of institutions to embed these courses into their educational and operational frameworks as well as on other forms of institutional support. The latter is thus a critical enabler for mainstreaming ORRI practices across European RPOs.

4.1 Embedding Training in Institutional Frameworks

To ensure that ORRI training becomes a regular feature of institutional change process and researchers' professional development, it is essential to integrate PATTERN courses into formal training activities, particularly aimed at early career researchers. This includes developing clear training plans that align with institutional goals, differentiating between mandatory, elective, and extracurricular training components, and offering formal recognition such as credits, certifications, or digital badges. Collaboration with Human Resources departments is key to embedding training within professional development and assessment frameworks.

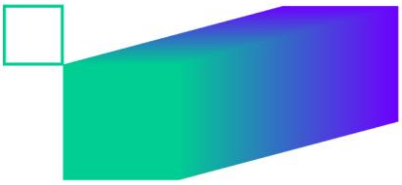
Furthermore, it is necessary to coordinate across faculties and administrative units to determine appropriate methodologies, delivery formats, and support systems. Induction training for new academic and administrative staff should include components on ORRI to instil responsible research values from the outset.

Finally, adoption of ORRI training in regular curricula allows institutions to continue refining and improving educational materials without relying solely on initial project funding.

4.2 Strengthening Institutional Capacity and Resources

Organisations must address several practical needs to support the uptake and delivery of ORRI training. These include:

- Providing access to digital infrastructure and co-facilitation tools.
- Developing a comprehensive "train-the-trainer" guide and repository of support materials.
- Ensuring access to qualified trainers, either through capacity building within the institution or through partnerships with external experts.
- Creating a structured feedback mechanism to assess the evolving needs of learners and trainers, for instance through institutional surveys.
- Continuing to track diversity metrics to ensure equal access and opportunities for all potential learners.
- Offering modular and flexible training to allow the learners for tailoring their learning experiences to their specific needs and schedules.



- Aligning the training to institutional regulations, e.g. Gender Equality Plans, to increase its attractiveness to institutions and funding bodies.

Institutional commitment can be fostered by demonstrating how ORRI training supports broader EU policy goals, enhances research quality, and contributes to societal impact. This calls for a strong communication strategy that highlights the innovative and interdisciplinary nature of PATTERN's methodology.

4.3 Facilitating Knowledge Sharing and Stakeholder Engagement

Universities and research organisations serve as vital connectors within the wider R&I ecosystem, capable of amplifying the reach of PATTERN training. They play a central role in linking academia, policy, civil society, and industry by:

- Supporting national and EU-level higher education initiatives.
- Developing local networks for knowledge exchange.
- Engaging with stakeholders through webinars, science shops, and targeted outreach.
- Promoting ORRI using familiar concepts like Open Science and research impact to broaden appeal.
- Encouraging mentoring and coaching programs
- Promoting staff exchanges om ORRI themes amongst different stakeholders.

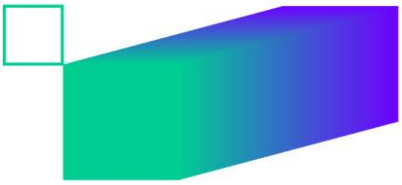
Strategically involving top-tier institutions and leveraging their influence can help integrate ORRI into national research agendas and policy discourse. Moreover, a key enabler for dissemination is the alignment of terminology and themes with recognised institutional and funding priorities.

4.4 Ensuring Sustainability Through Partnerships

The post-project viability of PATTERN content and methodology depends on continued collaboration both within and beyond the consortium. Internally, partners can take ownership of specific themes or content areas (e.g. gender and inclusion, research integrity) and commit to periodic updates. This can be operationalised by assigning responsibilities for maintaining content relevance, updating translations, and curating bibliographies and case studies.

Beyond the PATTERN consortium, synergies with National Contact Points (NCPs), university associations, research funders, and thematic networks (e.g. GENDERACTION+, EOSC, EuroDoc) are essential. These actors can help promote reuse of PATTERN materials through their training templates, calls for proposals, and outreach activities. Sister projects such as COALESCE offer additional opportunities for collaboration, particularly around overlapping topics.

The development of a loosely defined, modular training methodology—tailored to institutional contexts, learners' goals and supported by project-based learning—is a strength of PATTERN. Sustaining this approach will require both human resources



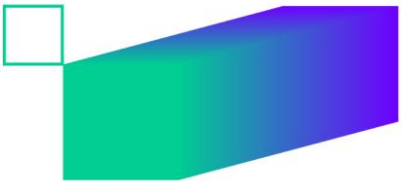
and digital infrastructure, such as community-maintained repositories (e.g. OpenPlato, REINFORCING platform) and clear metadata on content updates.

4.5 Overcoming Challenges

Despite institutional interest, challenges remain in embedding PATTERN training into formal curricula. These include bureaucratic hurdles, lack of internal expertise, and occasional resistance from senior leadership. To address these, PATTERN proposes:

- Advocacy and awareness-raising at the management level.
- Flexible training formats adaptable to different institutional needs.
- Teacher support packages for external facilitators.
- Alignment with funders' requirements to increase institutional motivation.

In conclusion, institutional support must be multi-dimensional, combining strategic alignment, practical resources, stakeholder engagement, and sustained partnerships. By addressing these areas, PATTERN can ensure that its training content and methodology continue to evolve and serve the needs of the European research community for years to come.



5 Conclusions

This report outlines a comprehensive strategy for ensuring the long-term sustainability of the PATTERN project's outputs, encompassing both its digital training platforms and the developed course modules. Sustainability is approached multi-dimensionally, addressing technical resilience, financial viability, content relevance, and institutional integration.

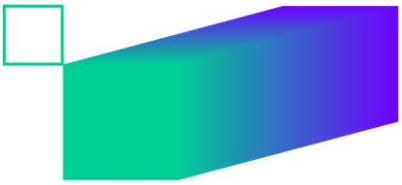
The **technical sustainability of the platforms**—the PATTERN website, the OpenPlato LMS, the Projects PBL system, and the integrated login—relies on the commitment of partner institutions like LOBA, OpenAIRE, and LPI for maintenance and security updates beyond the project's lifespan. Leveraging robust, open-source, technologies (Moodle, Projects and WordPress), and integrating with established infrastructures such as EOSC and Zenodo, are key technical strategies. While OpenPlato's core maintenance is secured by OpenAIRE, the sustainability of the Projects platform will require securing future funding, potentially through institutional partnerships, voluntary contributions, or new grants.

Content sustainability for the eight training courses focuses on maintaining relevance and accuracy over time. This involves decentralized stewardship, with thematic leaders and course authors responsible for regular updates to core content and case studies, supported by frameworks for version control, quality assurance, and reuse under appropriate licenses (e.g., CC-BY, CC0 for metadata). Embedding these courses within partner institutions' regular offerings, developing train-the-trainer resources, and adapting pedagogical approaches like flipped classrooms further enhance their longevity and impact.

Institutional support is crucial for embedding PATTERN's training within the European research landscape. Strategies include aligning training with institutional needs and funder requirements, fostering partnerships, engaging stakeholders, and advocating for ORRI training.

While it is acknowledged that challenges such as securing ongoing funding, ensuring platform interoperability, managing dependencies on external tools, and navigating institutional bureaucracy, this report presents clear mitigation strategies, including fostering a collaborative community, diversifying funding sources, and adopting flexible, modular approaches to both technology and content.

PATTERN is establishing a solid foundation for the sustained impact of its training platform and modules. Through strategic partnerships, robust technical planning, committed content stewardship, and proactive engagement with the wider research community, PATTERN aims to ensure its resources remain valuable, accessible, and relevant for researchers across Europe well into the future.



6 Appendix

Additional information has been discussed in-depth during PATTERN 2nd Open Studio Cycle, held in March 2025 in the context of WP4 activities. Accordingly, many institutional support points have already been covered by D4.3 Second PATTERN Policy Brief[3] in order NOT to duplicate content.

[3] D4.3 is a project's deliverable which is still under approval of the EC at the time of writing this document

Annex 1: Draft Sponsorship Agreement

To secure the long-term sustainability of the PATTERN Projects Platform, it is important to plan on how to diversify funding sources beyond internal contributions from PATTERN partners. While voluntary annual memberships from the Consortium partners remain the strongest and most immediate pathway for sustainability, external financial support from universities, research centres, foundations, academic networks and organisations committed to open science and RRI practices represents a strategic opportunity to strengthen and expand the platform.

The Draft Sponsorship Agreement included as Annex 1 is a practical instrument designed to formalise collaboration with external sponsors. It defines a clear, transparent framework for sponsorship engagement, offering multiple levels of support — Basic, Silver, Gold, and Strategic Partner — each associated with tailored visibility and collaboration benefits. These range from logo placement and social media promotion to dedicated showcases, co-branded initiatives and priority involvement in events and platform activities.

The Draft Sponsorship Agreement ensures that all sponsorships contribute to PATTERN's mission while maintaining the non-commercial, open-access nature of the platform. It aligns the financial contributions of sponsors with PATTERN's broader objectives of fostering open research, knowledge sharing and responsible innovation practices across Europe and beyond.

By mobilising sponsorship through the agreement, PATTERN aims to:

- Attract a broader community of academic and institutional supporters.
- Foster corporate social responsibility partnerships aligned with open and responsible research.
- Increase the visibility and sustainability of the training and project-based learning resources over time.

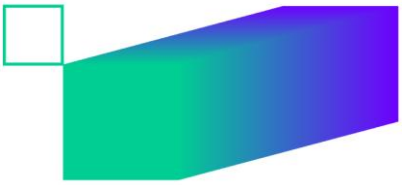
Draft Sponsorship Agreement Template

This Sponsorship Agreement ("Agreement") is made and entered into on [Date] by and between:

- **PATTERN Projects Platform owner ("Organiser")**, operated within the PATTERN Consortium (EU Horizon Project No. 101094416), with a principal place of operation at [Address]; and
- **[Sponsor's Name] ("Sponsor")**, with its principal place of business at [Sponsor's Address].

Purpose of the Agreement

The Organiser operates the PATTERN Projects Platform, a digital environment dedicated to supporting researchers through open, responsible and inclusive



research training. The Sponsor agrees to provide financial support to the Organiser to sustain and further develop the Training Platform and Modules, in exchange for sponsorship benefits as outlined in this Agreement. This sponsorship initiative is detailed in the PATTERN Training Platform and Modules Sustainability Plan (D2.3).

Sponsorship details

The Sponsor agrees to contribute an annual financial support package according to the selected sponsorship tier:

Tier	Contribution	Benefits
Basic Sponsor	€X/year	Logo placement on website; acknowledgement in newsletters.
Silver Sponsor	€X/year	All Basic benefits + feature in a "Research Spotlight" article + social media promotions.
Gold Sponsor	€X/year	All Silver benefits + dedicated webpage to showcase the sponsor's initiatives + priority listing.
Strategic Partner	€X/year (or more)	All Gold benefits + joint events, co-branded initiatives, exclusive collaborations, and prominent visibility.

Payment terms

The Sponsor shall remit the full sponsorship fee within **30 days** of signing this Agreement via bank transfer to the Organiser's designated account.

Term and renewal

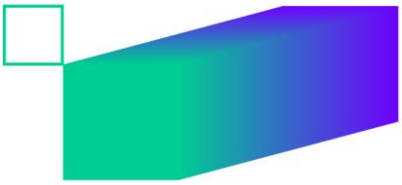
This Agreement remains valid for a period of **one (1) year** from the date of signature. Renewal is possible upon mutual consent, with the possibility of multi-year sponsorship agreements for enhanced collaboration.

Sponsor Obligations

The Sponsor shall provide all necessary promotional materials (logos, banners, descriptions) within **14 days** of signing. The Sponsor guarantees rights of use for provided materials.

Organiser obligations

The Organiser shall deliver all agreed sponsorship benefits and retain editorial control over platform content and sponsorship visibility, always in line with the PATTERN project's non-commercial, educational and Open Science principles.



Termination

Either party may terminate the Agreement with **30 days'** written notice. In case of Organiser-initiated termination not due to breach, a prorated refund will be offered. No refund is due if the Sponsor breaches the terms.

Indemnification

Both parties shall indemnify and hold harmless each other from claims, liabilities or damages arising from respective breaches of the Agreement.

Governing Law

This Agreement shall be governed by **EU law** and supplemented by **Belgian national law**. Disputes unresolved amicably shall be submitted to the General Court or, on appeal, the Court of Justice of the European Union under Article 272 TFEU.

Entire Agreement

This Agreement constitutes the full understanding between the parties and supersedes prior communications. Amendments must be made in writing and signed by both parties.

Signatures

For the Organiser:
Signature: _____
Name: _____
Title: _____
Date: _____

For the Sponsor:
Signature: _____
Name: _____
Title: _____
Date: _____

PATTERN.

Empowering Open and Responsible Research and Innovation

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