



# D5.5 GUIDELINES FOR ACCREDITING EDUCATION OUTSIDE THE CLASSROOM

Project acronym: OTTER

Project title: Outdoor Science Education for a Sustainable Future

Call: H2020-SwafS-2018-2020



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 101006482



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 101006482

Project no. **1010010082**

Project acronym: **OTTER**

Project title: **Outdoor Science Education for a Sustainable Future**

Call: **H2020-SwafS-2018-2020**

Start date of project: **01.09.2021**

Duration: **30 months**

Deliverable title: **D5.5 Guidelines for accrediting Education Outside the Classroom**

Dissemination level: **Public**

Due date of deliverable: **29-02-2024**

Actual date of submission: **29-02-2024**

Deliverable Lead Partner: **ESF – European Science Foundation**

Work Package: **WP5**

Keywords: **EOC, Education Outside the Classroom, STEAM, Science, Teaching, Accreditation, micro credentials, labelling, eco-school networks**

---

Please cite as:

Kray, Zs., Tahvanainen, A., Ipolyi, I., Azevedo, N.H., Monos, C., Marimon, O., O'Neill D. (2024). D5.5 Guidelines for accrediting EOC. Strasbourg, France. 57 pages.

---

Name	Organization
Zsuzsanna Kray	European Science Foundation
Antti Tahvanainen	European Science Foundation
Ildiko Ipolyi	European Science Foundation
Nathália Helena Azevedo	University of Groningen
Constantinos Monos	Center for the Advancement of Research & Development in Educational Technology
Oriol Marimon	The Big Van Theory
Deirdre O'Neill	University of Limerick

---

History			
Version	Date	Reason	Revised by
01	13.02.2024	First draft of deliverable	ESF
02	16.02.2024	Review of deliverable	RUG, UL, TBVT, CARDET
03	27.02.2024	Review of deliverable	ESF
04	28.02.2024	Review of deliverable	RUG, UL, TBVT, CARDET
05	29.02.2024	Final version	ESF

---

## Table of Contents

List of Acronyms.....	4
List of Figures.....	5
1 OTTER project.....	6
2 Project Consortium.....	7
Executive Summary.....	8
3 Executive summary.....	9
Educational landscape.....	10
4 Position within the educational context and leveraging advancements from prior OTTER outcomes and deliverables.....	11
4.1 European structures and instruments.....	11
4.2 European structures helping accreditation.....	12
4.3 Existing challenges for accreditation.....	14
4.4 OTTER results.....	14
Pathways.....	18
5 Possibilities in existing approaches and structures.....	19
5.1 Pathway definitions.....	19
5.2 Pathways and their preconditions.....	21
5.2.1 Teachers and EOC professionals.....	21
5.2.1.1 Teacher training.....	21
5.2.1.2 Short cycle programs.....	21
5.2.1.3 Adult education.....	21
5.2.2 Eco-schools.....	23
5.2.3 Programmes and activities.....	26
5.3 Bottlenecks.....	28
Entry points.....	30
6 Potential entry points for EOC in pilot countries' accreditation approaches.....	31
6.1 Finland.....	31
6.2 Ireland.....	33
6.3 Spain.....	36
6.4 Hungary.....	39
Recommendations.....	44
7 OTTER recommendations towards high-quality Education Outside the Classroom in Europe .	45
8 References.....	50
9 OTTER References.....	54
10 Annex.....	55

## List of Acronyms

AEE	Association for Experiential Education
ASF	Active School Flag
ASPnet	UNESCO Associated Schools Network
CEDEFOP	European Centre for the Development of Vocational Training
CEVAS	Countryside Educational Visits Accreditation Scheme
ECTS	European Credit Transfer and Accumulation System
EEA	European Education Area
EHEA	European Higher Education Area
EOC	Education Outside the Classroom
ENQA	European Association for Quality Assurance in Higher Education
EQAR	European Quality Assurance Register for Higher Education
EQF	European Qualifications Framework
ESG	European Standards and Guidelines for Quality Assurance
FEE	Foundation for Environmental Education
HEIs	Higher Education Institutions
ICT	Information and Communication Technology
ITE	Initial Teacher Education
LOMLOE	Ley Orgánica de Modificación de la Ley Orgánica de Educación (Organic Law modifying the Organic Law of Education)
LOtC	Learning Outside the Classroom Quality Badge
MAB	Hungarian Higher Education Accreditation Committee
MOOCs	Massive Open Online Courses
NFQ	National Framework of Qualifications
OKKA	Foundation for Teaching, Education and Personal Development
OECD	Organisation for Economic Co-operation and Development
PISA	Programme for International Student Assessment
QQI	Quality and Qualifications Ireland
RRF	Recovery and Resilience Facility
RVAC	Recognition, Validation, and Accreditation of Competences
SDGs	Sustainable Development Goals
SbS	Surrounded by Science
STEM	Science, Technology, Engineering, and Mathematics
STEAM	Science, Technology, Engineering, Arts, and Mathematics
WP	Work Package

## List of Figures

Figure 1 - Interlinkages among OTTER results .....	17
Figure 2 - EOC Accreditation Possible Routes.....	20



# 1 OTTER project

OTTER is a H2020-funded project aiming to enhance the understanding of methods and pedagogies surrounding Education Outside the Classroom (EOC) and how those effectively support the acquisition of scientific knowledge and transferable skills in students, specifically in the field of environmental sustainability and the reduction of plastic waste. It strives to increase interest in scientific topics among young people while contributing to a range of innovative educational projects, further establishing scientific citizenship within the EU.



Moreover, OTTER aims to strengthen education outside-the-classroom (EOC) networks within Europe, connecting experts from four different regions within the continent (Finland, Hungary, Ireland and Spain). The strengthened networks will be utilised to carry out a programme of EOC pilot schemes, further analysing their impact on student performance, including their levels of sophisticated consumption and scientific citizenship, ultimately building a clearer understanding of the effects of Education Outside the Classroom (EOC) on EU citizens. The pilot schemes will share a common theme revolving around issues of plastic waste and recycling, building on the existing momentum of joined efforts focusing on tackling related global educational, social, and environmental issues, as well as the need for sophisticated consumers.

## 2 Project Consortium



Geonardo Environmental Technologies  
(**GEO**)



European Science Foundation (**ESF**)



University of Groningen (**RUG**)



University of Limerick (**UL**)



Learning Scoop - oppimisen osuuskunta (**LS**)



The Big Van Theory (**TBVT**)



Center for the Advancement of Research &  
Development in Educational Technology  
(**CARDET**)

# Executive Summary



### 3 Executive summary

OTTER Deliverable 5.5 addresses the necessary conditions and considerations along with potential accreditation pathways and provides recommendations for STEAM Education Outside the Classroom to various stakeholders. Teachers, EOC practitioners, schools, Higher Education Institutions (HEIs), education providers, NGOs, researchers, education professionals, policy makers play crucial roles in mainstreaming EOC in educational practices and potentially contributing to its future accreditation, with due consideration for regional and national specificities.

Embracing and underpinned by the outcomes and outputs of the project, this deliverable presents three potential pathways for future accreditation:

- Certification of individuals, such as teachers and EOC professionals within the emerging micro credential system, aligning with EC recommendations;
- Accrediting physical sites, such as eco-schools, harmonising their functionalities, expanding their existing networks and establishing new ones;
- Labelling programmes and activities enhance transparency and credibility on the market, ensuring high-quality and reliable EOC programmes;

and provides a set of recommendations to policy makers, researchers and EOC professionals, HEIs and other education providers, STEAM teachers, EOC practitioners and schools, present and prospective eco-schools, NGOs, promoting quality education for all through the benefits of Education Outside the Classroom, and fostering an EU-wide quality education ecosystem.

This deliverable represents the pinnacle of the OTTER project, consolidating the results and conclusions from all previous deliverables to underscore the Education Outside the Classroom approach. It elucidates the pathways that can propel education towards a more sustainable and just future, synthesizing insights garnered from literature review, mapping study, and pilots.

The recommendations are integrated into the OTTER Learning Platform for easy access and utilisation in future EOC endeavours by practitioners, educators, STEAM teachers, and schools.

# Educational landscape



## 4 Position within the educational context and leveraging advancements from prior OTTER outcomes and deliverables

The European education landscape and related accreditation fall under national legislation framing potential pathways towards accreditation and the respective OTTER recommendations. The current mindsets in the [quality assurance](#) and accreditation of education and related recent policy discussions indicate that a collective endeavour aims to further [harmonise the broader European landscape](#).

### 4.1 European structures and instruments

The most significant initiative among endeavours of harmonizing the European education landscape is the [Bologna Process](#), comprising a sequence of ministerial meetings and agreements among European states aimed at guaranteeing comparability in standards and the quality of higher education qualifications.

The **European Education Area (EEA)** initiative helps European Union Member States work together to build more resilient and inclusive education and training systems, as access to quality and inclusive education, training and lifelong learning is a right for all citizens. The EU is advancing towards its objective by addressing five levels of education: early childhood education and care, school education, adult learning, vocational education and training, and higher education.

A latter initiative started in 1999 with the signatures of the majority of European member states, the initiative evolved into the **European Higher Education Area (EHEA)** by 2010, encompassing now 49 member states. As a result of this important change in the education field, all member states agreed to (1) introduce a three-cycle higher education system; (2) facilitate the reciprocal acknowledgment of qualifications and academic terms spent abroad; and (3) implement a quality assurance system.

The learning outcomes for bachelor's, master's, and doctoral cycles are described in the **European Qualifications Framework (EQF)**. The core of the EQF revolves around eight reference levels that articulate the knowledge, understanding, and capabilities a learner possesses, encapsulated as 'learning outcomes'.

This referencing system facilitates the comparison of qualifications across nations, even though it does not pertain to the specific content of the training programme. Instead, it shifts the focus from emphasising 'learning inputs' to 'learning outcomes'. Since the EQF is applicable to all forms of education, training, and qualifications, spanning from school education to academic, professional, and vocational pursuits, this approach must remain generic enough to be applied in any of these contexts.

On the way of adopting the EQF to the national realities **National Qualifications Frameworks (NQFs)** were established. EU Member States and 11 additional countries have committed to adopt the EQF to enhance its efficacy in aiding employers, workers, and learners in comprehending national qualifications, as detailed in D5.1.

As part of tools facilitating the recognition of study periods between EHEA institutions, the **European Credit Transfer and Accumulation System (ECTS)** is used to describe *"volume of learning based on the defined learning outcomes and their associated workload"* as per definition.

As for the common quality assurance system, the European Higher Education Area's goal is not to standardise national higher education systems but to enhance their comparability and foster mutual trust among higher education institutions. In 2003, the European Association for Quality Assurance in Higher Education ([ENQA](#)) was responsible for establishing the standards and guidelines, resulting in **European Standards and Guidelines for Quality Assurance (ESG)**. ESG is divided into three main parts: internal quality assurance system; external quality assurance system; and quality assurance agencies. These are naturally intertwined and interlinked. The guidelines do not dictate the exact implementation of quality assurance processes, but instead, they offer guidance, addressing essential aspects for successful quality provision and conducive learning environments in higher education.

As of today, exploring the tools within the European Education Area suggests that **there is no standardised European-level accreditation** procedure or authority in the field of education. Instead, various tools are in place to facilitate the comparison of qualifications and certifications issued by the Member States or other bottom-up global or Europe-wide programs.

Therefore, for the definition of the pathways (chapter 5.1) that may lead education professionals towards the standardized quality assurance, or, ultimately, the accreditation of STEAM EOC, needs to be situated in the matrix of **existing European structures, instruments and experiences**.

## 4.2 European structures helping accreditation

Examining the global education landscape and referring to **UNESCO's** definitions for recognition, validation, accreditation, and certification (**RVAC**) as cited in D5.1 *EOC accreditation in Europe: a mapping study*, in chapter 5.2, it becomes apparent that the distinct levels of accreditation serve diverse purposes and vice versa: the goal can guide the preferred method of certification. *"Recognition, Validation and Accreditation (RVA) of all forms of learning outcomes is a practice that makes visible and values the full range of competences (knowledge, skills and attitudes) that individuals have obtained in various contexts, and through various means in different phases of their lives."* (UNESCO)

Continuing the analysis and mapping of existing European education-related structures, it is essential to mention [Erasmus+ Teacher Academies](#). These academies foster European partnerships and facilitate cooperation between teacher education institutions and training providers. Their aim is to provide support for early-career teachers and enhance their professional development. The Erasmus+ programme envisions supporting the establishment of a minimum of 25 Teacher Academies by 2025.

Erasmus+ Teacher Academies, among other objectives, strive to establish networks of communities of practice in teacher education. They provide courses, modules, and other learning opportunities for teachers on EU priorities such as sustainability, equality, and inclusion. These academies aim to build enduring relationships between teacher education providers and various stakeholders. Additionally, each Erasmus+ Teacher Academy will undertake activities that deliver new and challenging joint learning modules on teacher education.

Although, having mentioned earlier that there is no standardised European-level accreditation procedure or authority in the higher education field, certain elements laying the groundwork of the [Europass framework](#) transparency tools, offer a detailed description of completed studies and indicate the competencies acquired during the course. Graduates in all countries participating in the Bologna Process are entitled to receive the [Diploma Supplement](#) automatically, free of charge, and in any major European language.

The Europass framework can be connected with the **micro credentials** system by providing a standardised format for documenting and presenting the micro credentials obtained by individuals. This integration allows for recognising and comparing of micro credentials across different educational and professional contexts within Europe, enhancing transparency and mobility.

*“[Micro-credentials](#) certify the learning outcomes of short-term learning experiences, for example a short course or training. They offer a flexible, targeted way to help people develop the knowledge, skills and competences they need for their personal and professional development.”*

Currently there is no consensus on the precise and ultimate definition of micro credentials. The most comprehensive definition is found in *Version one* of the UNESCO document titled "*Towards a common definition of micro-credentials (2022)*" which considered recent micro credential definitions used, among others, by the European Commission, the OECD, and other EC-funded projects (such as [MICROBOL - MicroHE](#)).

### **A micro credential** (also known as an alternative credential)

- Is a certified achievement of learning outcomes, competencies, or skills assessed as part of a short learning experience designed to enable employment and or lifelong learning.
- May stand alone or lead to or interact with other credentials or formal qualifications but is usually less than a formal qualification.
- Meets the standards required by relevant quality assurance processes.
- Ideally is owned, portable and shareable by the learner.
- May be required to meet stipulations imposed by relevant regional, sectoral or professional bodies.

Research done in OTTER shows a specific case in the Netherlands, where 32 higher education institutions actively participated in the Dutch national micro credentials pilot. As shown on the [project website](#), micro credentials confer independent value to smaller educational units (ranging from 3 to 30 ECTS in this specific pilot). These micro credentials symbolise education deserving accreditation and introduce a quality mark. The (paying) participant or employer can have confidence that the

course has been designed to ensure attainment of learning outcomes, with the accomplishment of these outcomes being traceable and verifiable.

### 4.3 Existing challenges for accreditation

In addition to the existing global and European-level structures and processes facilitating accreditation, it is essential to acknowledge the diverse perspectives of countries regarding certification and accreditation within their national education contexts. Each country has its own set of regulations, standards, and criteria for accrediting educational programmes, institutions or teachers, reflecting unique cultural, social, and political factors. Some countries may not have it all or opt to reject any forms of accreditation due to a variety of reasons.

First, there are cultural and philosophical differences whereby certain countries do not conceive of accreditation as a means of evaluating educational quality. The argument may be that such rigid systems undermine the autonomy of teacher, educational institutions and fail to capture the complexity of learning processes.

Second, there are those who believe that accreditation does not necessarily lead to enhanced learning outcomes. Instead, they advocate for more emphasis on formative assessment methods that focus on continuous feedback and improvement, rather than a one-time accreditation process.

Finally, reliance on formative assessment methods complicates the comparability of educational standards across borders, making it challenging to implement uniform accreditation systems that are acceptable to all countries. As a result, these factors contribute to the reluctance of some countries to adopt traditional accreditation frameworks.

In some cases, accreditation can focus more on compliance with bureaucratic procedures than on actually improving educational quality. Rigid accreditation can discourage educational innovation, as institutions may choose to follow a safer, more conventional approach to ensuring compliance with established standards. Critics also highlight the potential for bias and discrimination in accreditation processes, especially when subjective criteria are used, which can disproportionately affect certain groups or types of institution.

This variation in these perspectives can lead to differences in the recognition and acceptance of accredited qualifications across borders, impacting international collaboration in the field of education.

### 4.4 OTTER results

The following deliverables have proven invaluable in equipping the consortium with the necessary tools for engaging in thorough discussions and crafting comprehensive guidelines on accreditation. Through a collaborative effort, the consortium has utilised these deliverables to inform and shape the development of accreditation guidelines, ensuring a well-rounded and inclusive approach. By synthesising various perspectives and insights, these deliverables have facilitated a robust foundation upon which the consortium can build consensus and drive meaningful progress in the realm of accreditation.

The **D1.3 OTTER Gender Strategy** ensures effective gender mainstreaming in OTTER based on four crosscutting principles: (1) gender is a cross-cutting theme across the project; (2) project management is open, inclusive, and transparent and encourage equal opportunities for all genders throughout the project; (3) all research conducted throughout the project is gender-sensitive, paying attention to the participation of a range of genders, providing equal opportunities for all, and integrating gender into the research content; (4) Teaching, learning and assessment activities and pedagogical approaches developed and conducted throughout the project are gender-sensitive, paying attention to the involvement and engagement of a range of genders and providing equal opportunities for all. Each principle offers a few related Principles of Practice, indicating how the principle is evident in and informs the work of the project and partners throughout the deliverables, and so do so in D5.5.

The **D2.1 Literature review** reveals a wide range of pedagogical models analysed across academic literature. The reviewed studies reported an overall positive impact of EOC on students' cognitive and affective outcomes. Variations in activity duration and assessment methods are discussed, indicating the need for tailored approaches. Findings suggest that without pre and post-activities linking EOC experiences to in-class learning, the effectiveness of EOC learning may be compromised. Thus, teacher development programmes supporting educators in facilitating pre and post-activities, along with onsite EOC practices, emerged as crucial components for enhancing student learning outcomes and engagement.

Overall, D2.1 serves as a comprehensive compendium of studies, providing invaluable insights for teachers, EOC practitioners, school principals, and policymakers within the European educational landscape. Besides a notable research recommendation of the D2.1 is a strong focus on (gender-) inequalities and diligent corresponding reporting, irrespective of the nature of findings.

**D3.3 OTTER Lab guidelines** serves as a comprehensive guide for educators and practitioners aiming to establish an OTTER Lab, a competency-based learning initiative designed to enhance understanding and awareness of Education Outside the Classroom (EOC) methodologies. The OTTER approach provides a structured framework for educators to develop their classes, therefore, is easily adaptable to the diverse national educational contexts: it does not prescribe predefined content or methods but provides a framework within which educators can tailor the programme to suit their school and curriculum. Comprising five distinct steps - Prepare, Orientate, Discover, Make an Impact, and Reflect - the OTTER Lab approach encourages the application of distributed expertise and peer collaboration, fostering a cooperative learning environment where students actively engage and share their perspectives and knowledge throughout the process. This document provides a structured framework for educators to develop their classes, affording considerable autonomy in their pedagogical approaches.

**D4.2 Methodologies for monitoring and evaluation of partnerships and collaborations** is an essential stepstone towards D5.5. The deliverable demonstrates how to improve collaboration between the formal and non-formal education. By establishing clear standards to assess the quality of partnerships and collaborations, it is possible to foster a culture of cooperation and dialogue between sectors that allows for optimisation of the results of EOC activities. D4.2 also proposes a self-reflective questionnaire as an efficient tool to assess the EOC-related knowledge and skills of teachers and their network of collaboration to implement EOC.

**D4.3 Methodologies for monitoring and evaluating students** is a practical resource outlining a variety of assessment tools suitable to complement the OTTER Lab Learning Objectives, which are based on three key pillars: (1) sustainable practices, closely aligned with SDGs, (2) 21<sup>st</sup> century skills

based on the *Council Recommendation of 22 May 2018 on key competencies for lifelong learning 2018/C 189/01*, and (3) Inclusion and diversity to accommodate various geographical and cultural contexts across Europe.

**D4.4 is a report on integrated analysis of process and outcome data across all participating countries, including a comparison of student performance across gender and geographical location variables.** The findings in this report underline that students' engagement in the OTTER project activities increased their motivation to learn science and that it is due to the enhanced relationships with peers and teachers, engagement in class activities and active participation in science-related projects. Enhanced student learning and student agency in the wider school community also supported the finding of students' motivation to engage in science learning.

This report also outlines the effect Education Outside the Classroom has on building student citizenship. Providing meaningful connections with the community, fostering decision-making and problem solving and providing integrated and varied learning experiences were all viewed as vehicles for building a sense of citizenship among students. The acquisition of student knowledge on some SDGs could be attributed to their engagement in EOC experiences. In particular, findings show that connection to the local environment and student involvement in hands-on and experiential learning experiences are two of the most predominant factors that contribute to deep and meaningful knowledge generation. As regards the evaluation of the effects of EOC on student aspirations for scientific careers could not be measured in this study. An extended intervention and the collection of longitudinal data is advised for further research.

**D5.1 EOC accreditation in Europe: a mapping study** contributes to understanding how education outside the classroom is structured and how it occurs in practice in various contexts in Europe. Explicitly, it describes site accreditations through the analysis of three examples, such as LOtC, CEVAS, AEE. The deliverable highlights that it is essential to invest in national bodies that give accreditation to EOC activities to simplify the existing processes. Moreover, the study found very little information about the accreditation of learning *activities* in Europe and no evidence of a European network or framework.

**D5.2 A protocol for quality assurance to inform the accreditation process** offers a Quality Assurance Protocol that outlines guidelines, quality indicators and self-assessment rubrics for effective use by EOC practitioners and EOC providers willing to design and implement EOC activities and programmes adhering to the OTTER methodological framework. The deliverable addresses various audience by providing guidance, stimulating self-reflection, and offering pathways for improvement and refinement of their practice.

Three rubrics are devised to inform the internal evaluation processes on preset quality indicators: QA Rubric for (1) OTTER Methodology EOC Activities, (2) for EOC Practitioners, and (3) for EOC Providers. The rubrics aspire to serve as starting points for external validation and certification initiatives, taking into account the national and regional realities governing external assessment systems.

**D5.3, the Final OTTER toolkit**, serves as a practical guide for EOC practitioners aiming to implement education outside the classroom, particularly focusing on sustainable development and environmental issues. Consolidating the key findings of the OTTER project, this toolkit offers educators practical suggestions on how to seamlessly integrate EOC into their teaching practices, ensuring both

pedagogical soundness and effectiveness. By offering a range of ideas and applications, the toolkit equips education professionals with the tools needed to innovate their EOC practices.

This resource is integrated into the [OTTER Learning Platform](#), accessible to teachers, EOC practitioners, eco-school networks and EOC Providers, facilitating the design of future EOC projects and activities and providing tangible pathways for accreditation.

**D5.4 Practical recommendations for assessment methods** define the main quality parameters EOC assessments should be based on and suggest the construction of a practical evaluation grid to assure a common ground for the harmonized evaluation of practitioner and programme compliance. The assessment methods are conceived as a mutual and parallel tool used to evaluate the educational activities which aim to complement the assessment methods.

Recommendations in D5.4 propose flexible and adaptable assessment practices within EOC, accommodating national variations and allowing for diverse assessment types. It emphasizes the importance of understanding international best practices in assessment approaches while providing sample resources. Teachers are encouraged to use these resources to design their own assessment materials and make informed decisions about assessment in their classrooms. Finally, adaptation of resources to national language seems to be important for full understanding. It is evident that assessment plays an integral role in the accreditation process, thus, the work carried out in D5.4 is deemed crucial in advancing towards subsequent accreditation measures.

The following figure supports understanding of interconnectedness of the OTTER results and showcases how the previous works led to the conclusions of the present deliverable.

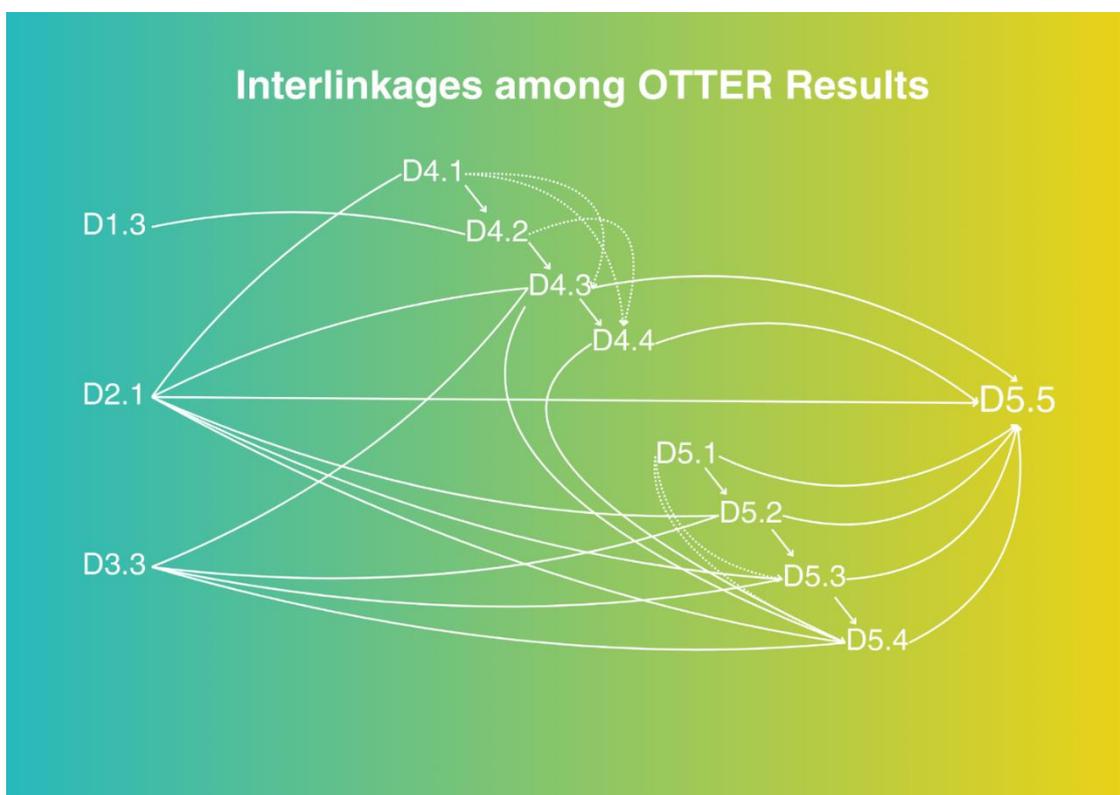


Figure 1 - Interlinkages among OTTER results

# Pathways



## 5 Possibilities in existing approaches and structures

### 5.1 Pathway definitions

For validation, certification and accreditation, three different scenarios were built within OTTER:

First, opportunities in certifying and accrediting **individuals** were analysed. Integrating EOC, for example, via introduction of the OTTER methodology into STEAM teacher training programmes and in-service teacher training is a fully plausible scenario allowing pathway development.

Second, sites are accredited by the Learning Outside the Classroom Quality Badge (LOtC), Countryside Educational Visits Accreditation Scheme (CEVAS), and Association for Experiential Education (AEE), but these examples are from the UK and the USA, while no information was found about similar European networks or framework. In the OTTER pilot countries, however a common point was identified: a network of **eco-schools** and the certification of their membership. An umbrella network, it embraces any school where ecological sustainability, "green" practices, and considerations for tackling biodiversity and the climate crisis are significant. This commitment and the schools' shared ethos are reflected in, inter alia, the school's founding documents, mandate, or mission statement. Connections with other schools sharing similar operational principles are part of the practice.

Third, the potential of validation, certification and accreditation in the domain of **programmes and activities** e.g.: educational programmes and activities conducted outside the traditional classroom setting, providing additional educational value to supplement the content outlined in the curricula. No pre-existing Europe-wide label, pledge, or badge across Europe for such initiatives was found, making the development of one a potential avenue for consideration.

The following graphic presents the structure of accreditation pathways and the necessary conditions and further considerations they indicate.

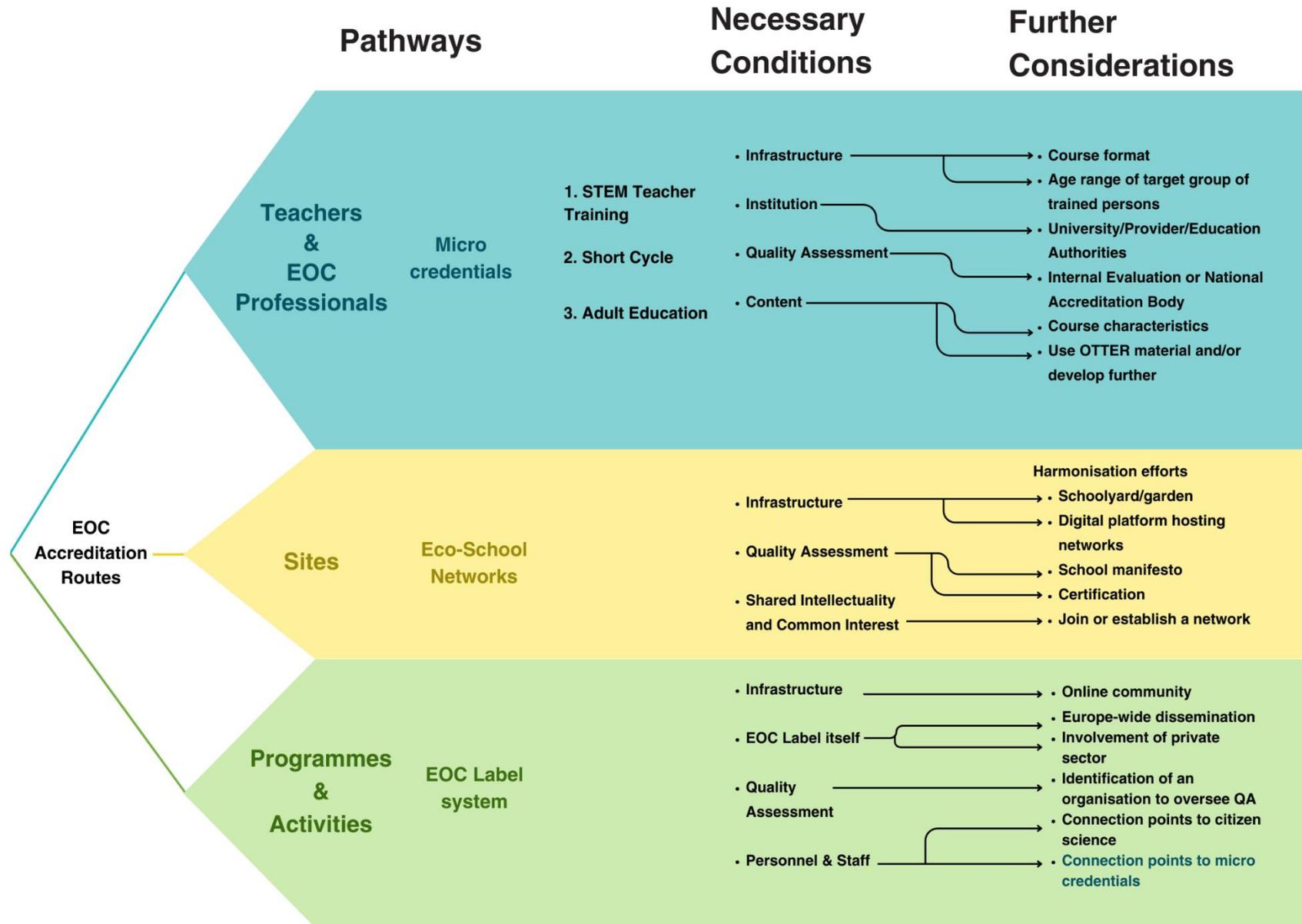


Figure 2 - EOC Accreditation Possible Routes



## 5.2 Pathways and their preconditions

During the OTTER project, three primary pathways were identified for potential implementation of accreditation or certification systems in the future. These pathways include (1) the recognition of teachers or EOC professionals through micro credentials; (2) existing and emerging eco-school networks; and (3) awarding of EOC Labels for quality Programmes and Activities.

### 5.2.1 Teachers and EOC professionals

Certification of teachers and EOC professionals can manifest in three primary formats. While alternative paths are conceivable, this deliverable primarily delves into the most prevalent ones in the OTTER pilot countries, as outlined below. As previously described, among the other aspects of accreditation, certain countries have objections to the term 'teacher accreditation'. Consequently, our approach emphasises the conventional avenues, elucidating how degrees, diplomas, and certificates enable individuals to teach EOC both within classrooms and in broader contexts.

#### 5.2.1.1 Teacher training

Typically, **STEM teachers** graduate through undergraduate and post-graduate programmes. Depending on country specific factors, EOC may be part of these training programmes at varying levels. Generally, EOC is not consistently taught as a standalone subject, but is often integrated into the methodology of teaching science subjects, for example by field trips and/or laboratory practices. The range of this approach varies among programmes and institutions, often also among teachers. Not all universities provide a comprehensive training on organising and conducting classes outside the traditional classroom. In some cases, it is an optional subject, where the most committed students invest time and effort in further developing these skills.

#### 5.2.1.2 Short cycle programs

**Specialised training programmes** are typically pursued after obtaining MSc (or, in some cases, a BSc degree). In certain countries it is possible to become, for example, a museum pedagogue, zoo-pedagogue, or outdoor programme manager after completing a specialised training programme in one to two years of extra studies. The typical entry points include a degree in science as a researcher, teacher, or pedagogue. Given that museums and zoos are locations for learning outside the traditional classroom, these existing programmes have alignment points with the goals of the EOC approach.

In some countries, it is also possible to acquire a teaching degree through a short-cycle program. Students with a MSc can enrol in a one- or two-year programme to become science teachers. Concerning EOC, the situation is analogous to the teacher training scenario, as education outside the classroom is not explicitly taught. However, candidates may gain some practical experience during the school practice period, but this is fully dependent on their level of personal commitment towards EOC.

#### 5.2.1.3 Adult education

**Teacher further development** serves as a platform for in-practice teachers to enhance their knowledge and competences in the field of EOC. These development courses are typically organised by the national Education Authority and/or a contracted external course provider. Depending on the national system, these courses may be mandatory at some level, chosen from a catalogue, where ECTS (or equivalent) can be earned for completing the course requirements. It should be noted,

however, that dedicated teachers who acquire more credits than the average are usually not adequately recognised for their efforts, neither morally nor financially.

In the realm of adult education, consideration must also be given to private providers, as newly hired staff members often must enrol in "**in-house**" training sessions before commencing their actual duties. For instance, individuals starting work as guides or animators at aquaria or science centres typically undergo a brief professional training before their official employment begins. Such programmes can be considered as EOC training courses intended for (those willing to become or enhance their skills as) EOC professionals.

## MICRO CREDENTIALS

Based on the aforementioned entry points for integrating EOC into existing education systems and recognising the imperative for flexible and modular solutions that align with current job market demands while providing individuals with visible credentials, the consortium inclines towards recognising potential openings in the European approach to **micro credentials**.

The recommendation embraced by the Council of the European Union in 2022 is geared towards fostering the development, adoption, and recognition of micro credentials across institutions, businesses, sectors, and borders.

## NECESSARY CONDITIONS

Regardless of how the entry points may be configured, if micro credentials systems are to be employed for certifying EOC teachers and professionals, several essential conditions must be in place:

- **Infrastructure:** A well-planned infrastructure is indispensable, encompassing both digital and physical components. Digitally, a user-friendly platform is required to host students, professors, ensuring seamless access to course materials and tools for course administration. Additionally, physical spaces, such as collaborative learning environments or dedicated laboratories, may be essential for practical components of EOC training.
- **Institution:** The identification of a dedicated institution is imperative for administrative and legislative purposes. This entity would oversee the coordination of the micro credentials system, manage enrolment, and ensure compliance with regulatory frameworks. Clear administrative structures and processes need to be in place to handle any legal or procedural matters.
- **Quality Assessment:** internal and external quality assurance mechanisms play a pivotal role in the certification process. The OTTER project incorporates internal quality assurance measures to ensure the content and delivery adhere to stringent educational standards. External quality assurance is typically overseen by national accreditation bodies, particularly when accrediting higher education institutions and their programmes and courses.
- **Content:** Developing a comprehensive and tailored content package is essential to complement the OTTER deliverables for courses eligible for micro credentials. This content

should encompass a diverse range of topics relevant to EOC, ensuring that participants gain a holistic understanding of the subject. The content design should align with the modular nature of micro credentials, allowing flexibility and adaptability to diverse learner needs.

These components collectively contribute to the establishment of a robust micro credentials system, reinforcing its efficacy in certifying EOC teachers and professionals.

## FURTHER CONSIDERATIONS

The present report would not extend beyond this point, as the objective is to delineate the potential pathways towards subsequent accreditation measures. However, it may be advantageous for further deliberations to take into account some of these elements when advancing this concept. These include considerations such as the **course format** (online, in-person, hybrid, on-site practice) and the typical **target group** of the trained individuals (elementary, secondary, high school students, or a cohort of young people in a non-formal setting).

The institution **hosting the courses, issuing certificates, diplomas, or micro credentials** in the given scenario may be a university, a training provider, or the Education Authority itself (in collaboration with external partners). The institution can influence the nature of the course and its location on the public-private continuum. It should be noted that external accreditation of these institutions is also a significant consideration as part of external quality assurance.

Public universities are accredited by a **national accreditation body**, and their programmes are typically accredited in the framework of programme establishment and evaluation procedures, for a certain period after which renewal is required. Private training companies may offer courses to the market without limitation or provide courses accredited by the Ministry of Education, Education Authority, or similar governmental body. Selecting the most appropriate institution to host such micro-credentialed EOC courses can have a long-term impact on the future and successful integration of education outside the classroom practices in the national education system.

Other **characteristics** of the course, such as its duration, number of modules, allocation of ECTS credits, etc., also play a part in further considerations important to the process. However, these aspects are certainly dependent on the capacities and preferences of the hosting institution, as well as the actual needs of the market and the demand (future students).

### 5.2.2 Eco-schools

As mentioned in the introduction, when it comes to the accreditation of sites, eco-schools are the closest iteration to our project objective. An eco-school is understood as an educational institution, typically a primary or secondary school, that adopts a holistic approach to environmental education and sustainable practices. Eco-schools aim to promote environmental awareness, sustainability, and responsible citizenship among students, staff, and the wider community.

The naming conventions may vary (such as green flag schools in Ireland, Eco-Schools (Vihreä lippu) in Finland, The Green Schools (Las Escuelas Verdes) in Spain, and Eco-school (Ökoiskola) in Hungary – *see list below*). The recognition of these schools falls under the jurisdiction of the respective national education authority. Other aspects of such schools cannot be disregarded when it comes to

accreditation. Besides the school being a physical space, it functions as an institution where (among others) STEAM teachers (and EOC professionals) conduct classes. Their qualifications may influence the eco-school status itself, and their individual certifications are described in the previous chapter.

These schools have everyday practices and habits that are difficult to certify as such. For instance, they often implement initiatives such as waste reduction, energy conservation, biodiversity conservation, and sustainable transportation practices. They may also engage students in environmental projects, eco-friendly initiatives, and community outreach activities to foster a culture of environmental stewardship and social responsibility. These actions could fall under the accreditation of programmes and activities (discussed in chapter 5.2.3).

Therefore, in this report, the complex functional mechanisms of schools will be examined by viewing them as networks. Within these networks, schools are interconnected to some extent, sharing common principles and occasionally convening for gatherings. They may collaborate on projects together or participate in twin-school initiatives.

## Existing networks

-  **EU and Global level:** The [UNESCO Associated Schools Network \(ASPnet\)](#) connects more than 12,000 schools in 182 countries around a common goal to build peace in the minds of children and young people. Through concrete actions member schools promote the ideals of UNESCO values. The Network operates at international and national levels with three clear priorities: education for sustainable development, global citizenship education and intercultural and heritage learning.

[Eco-Schools](#) is one of the largest global sustainable school programmes – it starts in the classroom and expands to the community by engaging the next generation in action-based learning. The programme's key success lies in its ability to cultivate generations of environmentally conscious individuals. They adopt sustainable habits learned from Eco-Schools, passing them on to future generations. Eco-Schools is implemented in 73 countries by [Foundation for Environmental Education](#) (FEE) member organisations and in 26 countries through International Schools.

-  **Ireland:** [Green-Schools](#) (known internationally as Eco-Schools) is Ireland's leading environmental management and education programme for schools. Promoting long-term, whole-school action for the environment Green-Schools is a student-led programme with involvement from the wider community. The programme is operated and coordinated by the Environmental Education Unit of [An Taisce](#) (FEE member for Ireland) the national trust.
-  **Finland:** [Eco-Schools Programme \(Vihreä lippu - Green Flag Schools\)](#), is operated by the Finnish Association for Nature Conservation (FANC) for more than 20 years. Currently, there are more than 350 schools registered in the programme in Finland.
-  **Spain:** The [Green Schools](#) are educational centres committed to sustainability, aiming to promote eco-social education that transforms both the educational centre and its environment. This involves networking with local stakeholders. Presently, there are over 800 schools in the Green Schools Network ([Xarxa d'Escoles per a la Sostenibilitat](#)).

The [other Autonomous Communities](#) have their relevant networks, such as Red Andaluza de Ecoescuelas (Andalusian Network of Eco-Schools), Red de Ecoescuelas de la Comunidad Valenciana (Network of Eco-Schools in the Valencia region), Red Canaria de Centros Educativos (Canary Islands Network of Eco-Schools), Agenda 21 Escolar al País Vasco (Agenda21 Schools of Basque country); non-exhaustive list.

- **Hungary: Eco-school network ([Ökoiskola Hálózat](#)):** the network's member schools address sustainability in an institution-wide way, helping to make sustainability principles a natural part of everyday life for future generations. Titles issued by the Education Authority are Ökoiskola (Eco-school) and Örökös Ökoiskola (Eco-school for Life).

## NECESSARY CONDITIONS

The functioning of certified or labelled eco-school networks necessitates the identification or establishment of several essential conditions to ensure their sustainability and effectiveness.

- **Infrastructure:** In this context, physical infrastructure is considered a given and an existing condition of the school building and its surroundings. It varies from school to school; some have access to schoolyards or school gardens, others are privileged with direct access to nature, or are purposely situated in the forest. Some schools have large enough halls to accommodate gatherings with other schools in the network. Therefore, when discussing necessary conditions, it is more appropriate to focus on the digital infrastructure that facilitates connection among schools, enables the initiation of shared projects, facilitates common teacher training, etc. This can be understood as a platform or a website.
- **Quality Assessment:** Internal quality assurance is often already defined by the school itself or is an attribute of the network. Eco-school certification serves as an external quality assurance framework, typically issued by the relevant Education Authority or a non-governmental association or foundation.
- **Shared intellectuality and common interest:** This shared ethos involves the exchange of ideas, knowledge, and best practices related to environmental education and nature pedagogies. By working together, eco-schools can amplify their impact and effect positive change within their communities and beyond. Furthermore, eco-schools often organise joint events and workshops for teachers, and bigger events for students and families. This collaborative approach not only enhances the intellectual capacity of individual schools but also strengthens the collective impact of the eco-school movement.

## FURTHER CONSIDERATIONS

The further consideration needs to be made if the eco-school concept is chosen as a tool for recognition:

**Join or establish?** From the list of eco-school networks provided, it is evident that their scope varies from regional to national and European to global levels. When considering European EOC school networks, it is crucial to evaluate whether establishing a brand-new network or creating one acting as

an umbrella network that embraces already existing ones would be more effective towards achieving consolidated and European-level EOC certification or accreditation goals.

**Harmonisation** is a multifaceted challenge in the educational landscape, governed by diverse national jurisdictions. Achieving coherence requires addressing legal and pedagogical disparities, while establishing guidelines for safety, curriculum, and community involvement. This process is vital for fostering alignment and consistency across eco-school networks and advancing towards a unified approach to certification and accreditation.

Although several questions remain unanswered, this is indeed one of the potential pathways towards STEAM EOC accreditation.

### 5.2.3 Programmes and activities

In the frame of non-formal and informal education, programmes and activities encompass educational initiatives conducted out of the conventional classroom environment, offering supplementary educational value to complement the conventional curricula.

A sister project of OTTER, Surrounded by Science (SbS), that aims to develop, among other things, an innovative impact assessment scheme to monitor individual engagement in science-related experiences, their progress towards science proficiency and to use this information to support learning. Moreover, it proposes a roadmap for an **accreditation scheme for informal science organisations**, by proposing opportunities to integrate informal activities with formal science education policies and strategies at a local, regional and European level.

Nonetheless, the certification of programmes may appear to be less tangible than certifying physical sites or individuals. Impact of programmes and activities on participants depends on whether they are one-off events or series of them. [Research shows](#) that frequent and repeated exposure to natural environment (especially at early age) enhance the future commitment towards pro-environmental behaviour, and potentially influences the choice of scientific career paths as well. Not only natural environments like forests, meadows, or riversides have this impact, but also guided visits to botanical gardens or science centres, for instance. The professionalism and personality of the EOC professional cannot be disregarded, as well as the background of the participants, highly influence the success of programme. If one were to certify activities alone, it becomes evident that the activities are closely connected with the physical location where the learning occurs. Consequently, potential overlaps with the two aforementioned opportunities (accreditation of *individuals* and *sites*) are observed that must be acknowledged.

Another perspective on programmes is to consider **university programmes**, as previously discussed in chapter 5.1, or specialised teacher training courses. In the case of universities, that typically submit their programme evaluations and establishment applications to the relevant national authorities for accreditation. The accredited status lasts for a defined period, with identified potential entry points and the learning outcomes that the programme offers.

In case of **specialised professional development courses for teachers**, the subject of accreditation remains to be determined: whether teachers earning micro credentials are to be accredited this way; or institutions providing the courses should be accredited; or the courses themselves are to be accredited. Ultimately, certification occurs wherever learning takes place,

therefore this can be considered at a later decision point, and it potentially allows flexibility for national specificities.

A Label system is a potential pathway to overcome the complexity of possibilities and the lack of harmonized approaches in this direction. Programmes in the framework of the Label system, activities are labelled if they possess pre-defined characteristics, within a programme itself, with the venue(s) and staff are allocated to the labelled activity.

In order support advancement in this direction, OTTER D5.2 offers a complex, but user-friendly self-assessment rubrics system for EOC providers – e.g.: botanical gardens, planetariums, but basically any type of EOC programme provider - to evaluate where they stand with their programmes in terms of pre-defined quality parameters and what possible advancements steps, they could consider improving what they have.

## NECESSARY CONDITIONS

In general, the effective operation of certified or accredited Label systems hinges on the identification or establishment of various critical conditions. These conditions are crucial for ensuring the longevity and efficacy of such systems, guaranteeing their continued functionality and impact.

- **Infrastructure:** Previously discussed in terms of physical buildings or sites, it is crucial to reiterate its significance here. Whether considering a one-time guided tour in a planetarium or a university programme lasting for (a) semester(s) or weeks (summer schools); physical infrastructure enabling accessibility for diverse audiences is paramount. Additionally, digital infrastructure is also necessary, such as participant registration systems. The younger generation favours interactive spaces where they can engage through ratings, comments, or tagging, which can be facilitated online. Therefore, establishing an online presence appears apt for these providers.
- **EOC Label itself:** It is imperative to delineate the EOC Label not just as a visual emblem but also to establish the underlying requirements. Identifying the issuer, compiling a list of providers, and regulating the usage of the label are equally vital considerations.
- **Quality Assessment:** Internal quality assurance is supported by D5.2 OTTER Rubrics providing a self-assessment mechanism for EOC providers to evaluate their activities and programs. External quality assurance bodies, however, remain undefined in the European context. It can be envisaged that an association, union, or foundation assumes the responsibility of coordinating and overseeing the label's usage.
- **Personnel and staff:** Activities and programmes rely heavily on adequately qualified EOC professionals or teachers. Their expertise and dedication are pivotal for the successful implementation and delivery of educational initiatives, ensuring high standards of teaching and learning in the field of education outside the classroom.

## FURTHER CONSIDERATIONS

Those wishing to embark on the path of establishing and managing EOC Labels are advised to begin by expanding the research outlined in chapter of Recommendations of this report, as examining

European Label systems is beyond the scope of the current study. However, the OTTER deliverables remain pertinent, as EOC providers are encouraged to utilise the **self-assessment rubrics**.

Finally, it is worth mentioning that a potential pathway forward from here may rely on the power of **citizen engagement and/or citizen science**. Citizen science, as one of the main pillars of open science in general, is viewed as fertile ground for data collection, an integral part of scientific practice. When a group of young people engages in a science-themed activity, they collect data through project-based learning. It's then just a step away to share this data on a platform dedicated to citizen engagement, and labelled EOC activities could be the perfect occasion for these actions.

### 5.3 Bottlenecks

Each member state holds unique educational policies, practices, and priorities, making it difficult to establish uniform accreditation standards that accommodate EOC practices across Europe. Thus, while recognising the significance of EOC in enhancing educational outcomes, fostering holistic development and equipping students with 21<sup>st</sup> century skills, navigating the complexities of a potential EU-level accreditation remains a significant challenge.

As stated in D5.1, Educational outcomes within the European Qualifications Framework are typically aligned with certifications obtained in formal education. However, integrating site accreditation mechanisms into the existing framework appears improbable, given that learning outcomes in outdoor settings are typically narrower compared to formal curricula. The European Qualifications Framework primarily accredits individuals based on extensive periods of knowledge acquisition and skill development, rather than short-term experiences such as outdoor excursions lasting only a few days. This implies a direct impact on the scope of possible accreditation pathways.

Moreover, regarding the integration of EOC into formal education, particularly within primary, secondary, and high school settings, there is currently a lack of accreditation guidelines across Europe. While similar guidelines are already established for Higher Education at the EU-level, they have yet to be extended to other educational tiers. Consequently, proposing accreditation guidelines for EOC presents a notable challenge for both the OTTER project and the broader European framework.

Limitations mentioned in D5.2 for internal and external quality assurance purposes remains a challenge carried forward. As stated, EOC activities occur in diverse learning environments, posing unique challenges, therefore standardised quality assurance and assessment across all contexts is complex, resulting further complications for accreditation.

The outcomes of EOC experiences are often diverse, encompassing the development of an array of 21<sup>st</sup> century life skills. Another challenge that exists regarding the assessment of skills relates to the ambiguity around the description of a particular skill. Measuring and assessing these outcomes in a standardised manner is inherently challenging, leading to additional complexities for accreditation.

Ensuring educators are prepared for quality EOC is vital. However, diverse professional landscapes across European states may render some quality assurance, assessment, therefore accreditation recommendations irrelevant. This stems from inadequate support, inflexible systems, and limited training opportunities. These barriers can obstruct the effective execution of our tailored propositions for outdoor learning environments.

Collaboration within EOC often entails educators, outdoor learning providers, and diverse accreditation stakeholders. Aligning efforts and communication among these stakeholders, each with their unique expertise and perspectives, presents challenges. It is imperative to explore establishing indicators to foster a shared understanding of quality assurance standards, common assessment methods and accreditation procedures across interdisciplinary teams.

Educational policies, whether at the European or national level, form a dynamic ecosystem, subject to ongoing revisions and updates. Integrating EOC into formal education may pose challenges in certain countries, while it is essential to recognise the presence of more adaptable educational systems, such as in Finland, where EOC is firmly integrated and flourishing.

Assessing the effectiveness of EOC activities demands robust and dependable evaluation methods. To ensure the credibility and consistency of assessments and accommodate the varied facets of EOC experiences, sophisticated tools and methodologies are necessary, alongside continued research efforts in this domain to reliably feed into accreditation processes.

# Entry points



## 6 Potential entry points for EOC in pilot countries' accreditation approaches

### 6.1 Finland

#### The Finnish way

[Finland's education system](#) has garnered global acclaim for its emphasis on equity, innovation, and learner-centred approaches. Finland has a well-functioning education and training system. According to the 2018 Programme for international student assessment ([PISA](#)), student performance in reading, mathematics and science is among the best in the EU; and has reached the target of less than 15% underachievement in reading and science.

Also, Finnish education is renowned for its commitment to teacher quality and inclusivity. By incorporating EOC principles, educational institutions are not only broadening the scope of learning beyond traditional classroom settings but also fostering experiential and holistic development among students. This integration enables learners to engage with real-world scenarios, thereby enhancing their critical thinking skills, problem-solving abilities, and environmental awareness.

The [Finnish ethos](#) prioritizes learning over testing and accrediting, fostering a conducive environment for holistic development and continuous learning. In Finland's basic education system, there is an absence of national examinations for pupils. Instead, teachers assume the responsibility of assessing students in their respective subjects according to the objectives outlined in the curriculum. Evaluation of students primarily occurs at the local level, adhering to criteria and descriptions outlined in the national core curriculum.

Currently, assessment for students in grades 1-6 of basic education primarily entails verbal evaluations rather than numerical grading. There exists no centralised testing for all students in basic education, and teachers are responsible for assigning grades in the basic education certificate, which is awarded at the conclusion of year 9. The assessment approach towards schools and students is characterised by its supportive and encouraging nature, devoid of national examinations, school rankings, or inspection systems.

Hence, within the scope of the present deliverable, it appears improbable to compel a proficiently functioning system towards excessively formalised and standardised accreditation procedures. A more prudent strategy entails embracing diversity and identifying genuine and potential avenues of integration that align with the ethos of the Finnish education system while facilitating a degree of comparability at the European Union level.

#### Micro credentials

In the meanwhile, Finns have been agile in developing smaller fractions of competence, a type of short-term training that promotes employment and continuous learning, as per Sanna Brauer, Oulu University of Applied Sciences ([Oamk](#)).

Despite the success of Finland's educational model, there exists a growing discourse on the integration of micro credentials to further enhance learning outcomes and workforce readiness. As per [OECD](#), Finland is in the process of implementing a reform of its continuous learning provision and

has already started stakeholder discussions to define the scope and focus of a national micro credential ecosystem.

As an example, to achieve this, there is an ongoing effort, the [Una Europa Micro credential in Sustainability](#) specifically enables learners to study five different MOOCs (Massive Open Online Courses) introducing them to sustainability, biodiversity, climate change, political economy and the arts. The courses are co-created by the University of Helsinki, University of Bologna and Jagiellonian University in Krakow. The Micro credential programme gives a holistic understanding of global sustainability challenges and how to address them, moreover, critically discusses the theories and concepts of sustainability. It responds to the demands of green transition, the labour market and society at large. Finally, it offers a flexible way to supplement a degree from any discipline with research-based knowledge on sustainable development and skills, worth 10 ECTS.

However, at the current state it is hard to find information on the applicability of the micro credential system in teacher education. Teachers in Finland are highly qualified and respected professionals. Prospective teachers undergo comprehensive training programmes, typically at university-level institutions, which equip them with a deep understanding of educational theory, subject-specific knowledge, and practical teaching skills.

A potential avenue for collaboration with the European-level education system appears to be the integration of micro credentials with EOC themes. However, this endeavour must be approached through a co-creation process that honours and integrates the effective elements of the Finnish education system. Further exploration and piloting are imperative to ensure viability and effectiveness.

### **Eco-school networks**

Another opportunity identified in previous chapters are the eco-school networks. The next two examples are existing school networks, where sustainability goals are at the heart of the member schools. The [Finnish eco-school networks](#) serve as vibrant hubs for environmental education and sustainability initiatives within the nation's educational landscape. By embedding eco-conscious values into curriculum and school culture, these networks play a pivotal role in nurturing environmentally responsible citizens.

Moreover, the [OKKA Foundation](#) (a foundation for teaching, education and personal development supporting the educational sector) oversees the Finnish national Sustainable Development Certification for Educational Establishments, applicable across comprehensive and upper secondary schools, vocational institutions, and adult education centres. This system provides criteria, evaluation tools, and supporting materials for self-assessment and development towards sustainability in management, teaching, and operational practices. Institutions can undergo external audits and apply for certification through the OKKA Foundation. As of March 2018, the foundation has conferred the sustainable development certificate upon 100 educational establishments. Funding for the certification system comes from the Ministry of Education, supplemented by contributions from the OKKA Foundation and project-based support.

In conclusion, Education Outside the Classroom (EOC) is historically embedded into curricula; accreditation is perceived unfavourably within the context of the education system, moreover, Finland has initiated first endeavours towards the implementation of micro credentials. Thus, it appears that continuous innovation is underway, with the trajectory suggesting a path forward where flexibility is poised to sustain and foster future growth.

## 6.2 Ireland

### Education in Ireland

Key features of the [Irish education system](#) include a large number of small schools (of the 3,250 primary schools, approximately 600 are 2- or 4-teacher schools). Education is free in general; the school system is mainly private in the sense that all primary schools and the majority of second level schools are not public schools but are locally owned by organisations or religious denominations. Two official languages are Irish and English. English is the medium of instruction in the majority of schools, while Irish is also taught. However, in designated Gaeltacht schools, Irish is the medium of instruction, with English also being taught.

Key challenges for the education system are to cater for a rapid growth in enrolment in schools; promotion a more pluralist school system which better caters for diversity, particularly religious diversity, in line with the changing profile of the population. Addressing the high levels of youth unemployment is especially important in the light of teaching 21<sup>st</sup> century skills, as ICT, life and career skills, communication and cooperation.

Achievement levels in science, as performance returned close to the performance observed in 2015, but remained below the high mark set by [PISA](#) 2012. In mathematics, mean performance was below that of any other assessment since 2012. These results also highlight the importance of the need for teaching critical thinking and scientific literacy to a larger extent.

The [Irish primary school](#) curriculum is child-centred. The National Council for Curriculum and Assessment (NCCA) works with learners, teachers, practitioners and parents to develop research-based curriculum and assessment. Its vision is to lead innovation in education for living, learning and working in a changing world.

Addressing inclusion and diversity in Ireland, educational provision for students with special educational needs ranges from additional support in mainstream schools to specialist support in special schools. A student with a disability may be enrolled in a (1) mainstream class with additional support, (2) special class in a mainstream school or (3) special school.

### Accreditation in Irish education system

In the realm of accreditation within Irish education, diverse bodies exist, each with its own area of emphasis, ranging from primary education to higher education institutions. Their collective role is pivotal in ensuring the maintenance of educational standards and the enhancement of overall quality across the educational spectrum in Ireland.

### Quality and Qualifications Ireland (QQI)

[QQI](#) is a body responsible for the external quality assurance of further and higher education and training. It makes awards for these sectors and validates programmes for providers. QQI is also responsible for the maintenance, development and review of the National Framework of Qualifications (NFQ). Quality and Qualifications Ireland regards accreditation, as the formal recognition of what a student has learned. Accreditation not only gives a student a sense of personal achievement and show what they have learned, but achieving accreditation may also allow the student to progress to further education and training or better employment opportunities.

The National Framework of Qualifications ([NFQ](#)) describes what learners need to know, understand and be able to do to achieve a qualification. It lists the main qualifications awarded at each level and pathways from one NFQ level to the next. The NFQ is a system of ten levels. Each level is based on nationally agreed standards setting out what a person is expected to know and be able to do following a process of learning. QQI oversees and regulates accreditation in Ireland.

### Teaching Council of Ireland

The Teaching Council is the professional standards body for the teaching profession, which promotes and regulates professional standards in teaching since 2006. It acts in the interests of the public good while upholding and enhancing standards in the teaching profession. The Teaching Council – that consists of 37 members - do this through the statutory registration of teachers, ensuring a highly qualified teaching profession, whose members meet and uphold high standards of professional competence and conduct.

[Céim](#) are standards for programmes of Initial Teacher Education (ITE) in Ireland. Initial teacher education programmes for primary and post-primary teachers are provided by a range of concurrent (undergraduate) and consecutive (postgraduate) programmes. Minimum entry requirements for programmes of initial teacher education are set by the Minister for Education, in consultation with the Teaching Council. All initial teacher education programmes (primary, post-primary and further education) in Ireland that lead to registration must have professional accreditation from the Teaching Council. Céim is within the NFQ above and specifically related to teaching degrees. Degrees in teaching are delivered within the university which is accredited by the QQI with NQF standards.

Routes to accreditation include three main paths. Starting a new programme where new programmes shall be subject to a General Review meaning that all aspects of the programme will be reviewed. Addition to existing programme applies to existing post-primary programmes, where a new subject strand/methodology is being added. Third, the accreditation of a programme typically lasts for five years. When this period is over, accreditation must be awarded again.

[Standards for Initial Teacher Education](#) describes among others the Core Elements of ITE Programmes, that states the importance of Global Citizenship Education, meaning Education for Sustainable Development (ESD), social justice, and interculturalism. There should be demonstrable integration between Inclusive Education and Global Citizenship Education rooted in the principle of care for others.

Moreover the ITE also outlines among facilities, that should be available to support research, teaching and learning such as access to Digital Technology resources that are supportive of (online) teaching, learning and assessment; Science resources, as appropriate and Science labs.

In conclusion, while the accreditation landscape in Irish education, overseen by bodies like Quality and Qualifications Ireland and the Teaching Council, plays a vital role in maintaining and enhancing educational standards across various levels and disciplines, it is notable that accreditation procedures appear to provide necessary conditions to STEAM subject teaching. However, it is worth noting that Education Outside the Classroom (EOC) does not seem to hold significant weight within the accreditation process. Through rigorous processes and adherence to the National Framework of Qualifications (NFQ), accreditation not only recognises students' achievements but also facilitates their progression to further education and improved employment prospects by teaching 21<sup>st</sup> century skills. The focus on professional standards, as outlined in Céim, ensures that educators are equipped

to meet the evolving needs of learners, promoting principles of inclusivity, global citizenship, and technological proficiency in educational practices.

### Micro credentials

[Irish Universities Association](#) (IUA) and their seven partner universities in consultation with enterprises, are developing micro credentials on a wide range of different topics. Among subjects, one can choose Teaching and education, but there cannot be found any in the topic of Science teaching or specifically EOC. Despite there are available [microcred](#) courses in Science, Food and agriculture and several others that might be related to OTTER, none of them tackle the topic of STEAM teaching.

### Awards and certification for EOC practices

[Green-Schools](#) (known internationally as Eco-Schools) is Ireland's leading environmental management and education programme for schools. Promoting long-term, whole-school action for the environment Green-Schools is a student-led programme with involvement from the wider community. The programme is operated and coordinated by the Environmental Education Unit of An Taisce (FEE member for Ireland). Following the award of a school's first Green Flag, schools must submit renewal applications every two years. Registration and materials are free to all schools taking part. Schools typically work on a theme – that are Litter & Waste, Energy, Water, Travel, Food and Biodiversity, Global Citizenship and Marine Environment – for one full school year.

Partially relevant, but still enhancing outside the classroom activities in Ireland the Active School Flag ([ASF](#)). It is a Department of Education initiative supported by Healthy Ireland, and part of the National Physical Activity Plan. The ASF initiative provides schools with a framework to guide, support and incentivise them to work towards achieving a physically educated and physically active school community. Once awarded, ASF remains valid for a period of 3 years, after which time schools are invited to re-engage with the process.

[Forest School Ireland](#) is an organisation that facilitate EOC and train facilitators to become accredited in Education Outside the Classroom. At Forest School, children of varying ages regularly convene at the same woodland or natural setting, typically for 2-3 hours once a week, under the guidance of certified Forest School Leaders, currently accredited by the Open College Network at Level 3. Each session involves consistent engagement with a small cohort of participants over an extended period, with a minimum duration of ten weeks preferred, although experiment suggests that sustained involvement over a full school year yields optimal outcomes. Ensuring the presence of qualified Forest School leaders is paramount to the programme's efficacy. The Certificate course provides a professional qualification encompassing theoretical knowledge and practical skills necessary for leading Forest School sessions. It caters to a diverse audience, including educators, early years' practitioners, youth workers, environmental educators, and individuals with an interest in outdoor learning and development, thereby contributing to the expanding cadre of proficient Forest School leaders in Ireland.

[Brigit's Garden](#) an example that provides Certificate in Forest School Leadership in Ireland, culminating in a Level 6 accreditation on the National Framework for Qualifications. Classified as a Special Purpose award, this certification carries a credit value of 20. The programme is meticulously designed to furnish participants with the requisite knowledge, skills, and proficiency essential for operating as certified Forest School leaders. It is structured to facilitate the leadership of outdoor

Forest School initiatives catering to children, families, and adults, placing a central emphasis on fostering a deep connection with nature within the instructional framework.

Upon comprehensive examination of both top-down and bottom-up perspectives, it is evident that opportunities for Education Outside the Classroom (EOC) accreditation exist through diverse accreditation stakeholders. Furthermore, a fertile ground for the integration of EOC principles into core curricula is discernible within the Irish educational context. The burgeoning provision of micro credentials presents an avenue for the expansion of STEAM Education Outside the Classroom courses. Various European- and nation-wide initiatives, particularly eco-school networks, offer practical and operational frameworks, whereby an intensified focus on EOC principles may foster greater alignment of endeavours in this direction.

## 6.3 Spain

### Learning and teaching in Spain

[Spanish education system](#) is decentralised. Responsibilities related to education are shared between the central, General State Administration (Ministry of Education and Vocational Training) and the 17 authorities of the Autonomous communities (Departments for Education). The central education administration executes the general guidelines of the Government on education policy and regulates the basic elements or aspects of the system; while regional education authorities develop the State regulations and have executive and administrative competences for managing the education system in their own territory.

Spain has prioritised the modernisation and flexibilisation of its education system, by regaining the equality lost during the crisis years; by increasing STEM vocations, especially among female students; and by guaranteeing education in civic values in order to enable the exercise of critical and participatory citizenship, to mention the most relevant items from OTTER perspective.

In Spain, teachers' salary is higher than the average in the European Union, however, the maximum increment is lower than the average and the time needed to reach that level is among the highest in the EU. Currently, a legislative proposal (LOMLOE) introduction ended at the beginning of the school year 2023/24, is being worked on to regulate, among other things, initial and continuous training, access to the profession and the development of the teaching career.

As for the scientific knowledge of the 15-years-old students, in [PISA](#) tests, the average 2022 results in Spain were down compared to 2015 in mathematics and science. Spanish students scored close to the OECD average in mathematics and science.

### Accreditation in Catalonia

The accreditation of an educational programme for implementation in a university, school or educational centre in Catalonia may depend on the type of accreditation one is seeking and the educational level it targets. The Agència per a la Qualitat del Sistema Universitari de Catalunya ([AQU Catalonia](#)) plays a significant role in accrediting university educational programs, while the Departament d'Educació de la Generalitat de Catalunya handles primary and secondary education.

AQU is the main instrument for the promotion and assurance of quality in the Catalan **higher education** system. AQU Catalunya is entrusted with the assessment, accreditation and certification

of quality in the universities and higher education institutions in Catalonia. The Catalogue of services (2018) establishes AQU Catalunya's main action principles and identifies the activities and services that it offers, such as (1) programme and institutional review, (2) assessment of teaching staff, (3) knowledge generation, (4) internationalisation. Moreover, AQU Catalunya is full member of the European Association for Quality Assurance in Higher Education (ENQA) and has been one of the first three agencies to be included in the European Quality Assurance Register for Higher Education (EQAR).

## Teacher accreditation

Prospective STEM teachers in Catalonia undergo [initial teacher education \(ITE\)](#) at universities or teacher training colleges, where coursework focuses on STEM subjects, encompassing mathematics, science, technology, and engineering principles. This aims to furnish them with a robust foundation in subject content and pedagogical strategies.

Subsequently, during their ITE programmes, aspiring STEM educators undertake teaching practice placements in schools under mentor supervision, honing their teaching skills and gaining practical experience in real classroom environments. Following their initial teacher education, STEM teachers in Catalonia participate in continuing professional development activities to refine their expertise. These opportunities, including workshops, seminars, and online courses, target STEM content knowledge, innovative teaching methods, and technology integration.

Catalonia also fosters collaborative networks among STEM teachers, facilitating knowledge exchange and professional development at regional, national, and international levels. Furthermore, partnerships between educational institutions, industry, and research organizations enrich STEM teacher training by offering professional development opportunities and hands-on experiences in STEM fields.

The accreditation of training provides teachers with the opportunity to augment their teaching curriculum, rendering it imperative for educators to pursue accreditation. As teachers' portfolios evolve, they accrue benefits such as decreased teaching hours and augmented salary prospects.

## Further certifications and acknowledgements for EOC practitioners

Educators active in the field of non-formal education can pursue courses specifically designed for nature and sustainability education. These programmes offer a structured curriculum and assessment, leading to certification. These programmes typically cover topics such as ecology, conservation, and other sustainable practices.

- University extension programmes
- Professional development programmes
- Courses offered by environmental education organizations and learning centres
- Workshops organised by non-governmental organizations focusing on environmental issues

Furthermore, active engagement in the subsequent activities can yield additional valuable knowledge and skills, often leading to the attainment of badges or other forms of online recognition.

- On-the-job experience by participation in environmental projects
- Enrolment to platforms and online courses (often MOOC)
- Conference and workshop attendance
- Engagement in community-based programs
- Endorsement by peers and recommendations from professionals

Accreditation entities may employ portfolio evaluation as a criterion for certification, thus professionals engaged in Education Outside the Classroom have the option to assemble a portfolio exhibiting their expertise, educational resources, and effective initiatives.

### Micro credentials

Higher education in Spain comprises 89 universities, 50 of which are funded by the state. Spain's higher education sector is excellent, and it attracts not only Spanish students but also students from abroad. From approximately 1.6 million students in the higher education sector, there are around 224,080 international students enrolled in Spanish universities.

Spanish public and private universities presently provide micro credentials, albeit in a restricted capacity. Supported by the funding from the EU's Recovery and Resilience Facility (RRF), Spanish public officials and higher education authorities aspire to introduce micro credentials extensively within their higher education framework.

As per a [case study](#) about micro credentials conducted by OECD in Spain, the implementation assets are (1) funding for micro credential scale-up is available, (2) recent legal and regulatory measures facilitate micro credential adoption, and (3) universities have experience with short learning programmes, that facilitates further improvement of micro credential systems in the country.

Among the types of unofficial credentials awarded by Spanish universities, micro credentials worth usually less than 15 ECTS, and no prior degree is required. However, among challenges may be mentioned that multiple stakeholders argued that public universities are, as of now, weakly oriented to labour-market skill demands, with the skills of graduates often being mismatched to employer skill needs.

[CEDEFOP report](#) shows, that all current developments in terms of draft regulations in the higher education sector consider micro credentials to be proof of the learning outcomes that a learner has acquired following a short learning experience. 'Outcomes' refer to concrete skills, defined in the future national Catalogue of vocational competence standards (Catálogo Nacional de Estándares de Competencias Profesionales) which will replace the current catalogue. Thus, micro-training will be related to competence standards, a smaller reference than the currently used reference of qualifications.

One of the prominent initiatives in Spain is [MiríadaX](#), recognised as the foremost micro credential platform with a substantial reach of over 7 million students and significant influence across Spain, Portugal, and Latin America. While on MiríadaX platform, Education and Innovative Education stand out as browsable categories, it's notable that no courses related to STEAM subjects are featured in this category. Within the environmental category, only three distinct courses are offered, primarily

aimed at company personnel. Similarly, in the science and engineering category, the majority of courses are tailored towards industry professionals.

Hence, it may be inferred that the Spanish system appears ready to adopt the micro credential system. Nonetheless, a significant deficiency is noted among micro credited courses in Science teaching courses, particularly in relation to the emphasis on EOC.

## 6.4 Hungary

### Overview of the education system

In Hungary, central educational governance and supervision primarily fall under two ministries: the Ministry of Interior, overseeing public education, and the Ministry of Culture and Innovation, responsible for higher education, vocational education, and training. Adult education is under the purview of the Ministry of Technology and Industry. Vertical governance is delineated among central (national), territorial, and to some extent, institutional levels in both vocational education and training (VET) and public education.

In 2013, the maintenance of municipal schools was centralized under a central state institution maintenance centre. Subsequently, the government established the [Klebelsberg Centre](#), now the national body responsible for coordinating the maintenance of public education institutions. Since 2017, the Klebelsberg Centre has overseen the 60 School District Centres, acting as independent budgetary entities responsible for maintenance and operation. However, this system still limits school directors' autonomy and tools to enhance teaching quality.

One of the pressing challenges confronting Hungary is the escalating shortage of teachers. [Research underscores](#) that the pivotal determinant of student performance resides in the quality of teachers. Nevertheless, schools across numerous EU nations, Hungary included grapple with the daunting task of filling teaching vacancies. Notably, teacher shortages in Hungary are particularly pronounced in disadvantaged areas, notably impacting mathematics, science subjects, foreign languages, and vocational education and training.

Only around 1 in 10 teachers in Hungary think that their profession is valued by society ([TALIS 2018](#)). In a recent survey, teachers cited low wages, high workload, lack of professional autonomy, the composition of the curriculum and administrative burden as the biggest problems ([TÁRKI, 2023](#)). The standards and outcomes were adjusted to the [2020 national core curriculum](#), including expanded content on digital skills. An integrated science teacher training programme was also launched in 2022/2023 but attracted very few applicants.

The [average actual salary](#) level of teachers exhibits a robust correlation with the gross domestic product (GDP) per capita of a country, whereby higher GDP per capita translates to higher average annual salaries. Notably, in ten countries, Hungary included, teacher salaries lag behind the GDP per capita across all educational levels. The starting salary aligns with the career level of a fully qualified trainee teacher. Subsequent salary increments are delineated by career progression, with teachers reaching 'teacher I' level after 10 or 15 years. However, the majority of teachers eventually ascend to the top salary tier designated as 'teacher II' as they advance in their careers.

## Accreditation in Hungary

The Hungarian (Higher Education) Accreditation Committee ([MAB](#)) serves as an independent national expert entity tasked with externally evaluating the internal quality assurance (QA) system of higher education institutions. The Committee is responsible for accrediting both institutions and programmes within the higher education sector.

The institutional accreditation process aims to verify and certify that higher education institutions (HEIs) adhere to the quality assurance guidelines and standards outlined by the EHEA and ESG 2015 (Standards and Guidelines for Quality Assurance in the European Higher Education Area). It entails ongoing monitoring and assessment of compliance with these standards, with the assessment outcomes used to actively enhance the implementation of said standards.

Regarding programmes, there are two primary processes: the establishment and evaluation of applications for new programmes. These regulatory procedures pertain to the initial registration and launch of bachelor and master programmes within higher education institutions. Initiated by the relevant higher education institution in collaboration with the Educational Authority, MAB provides expert opinions based on ESG standards regarding the documentation submitted. Upon successful completion of the process, the programme is included in the registry.

## Acquiring a STEM teacher degree in Hungary

In Hungary, obtaining teacher qualifications can be pursued through three avenues: (1) attaining a teacher's MA degree; (2) completing an undivided long training programme, known as teacher's training; and (3) pursuing a non-teacher master's degree in a specialized teaching discipline, either concurrently with an undivided long training programme or after obtaining a master's degree in teaching. This framework is outlined in §1 of Ministry of Human Capacities Decree [8/2013 \(I. 30.\)](#).

Teacher training programmes may be structured as undivided master's programmes (or in some cases, divided programmes as determined by the government). The duration of such training must be between ten and twelve semesters for undivided programmes. These programmes typically include two semesters of professional practice integrated into the overall training, conducted within school settings and involving individual, coherent school practice. Students in these programmes can earn 300-360 ECTS equivalent credits, and upon completion, may be awarded a Master's degree.

In higher education institutions offering teacher training, the coordination of professional, content, organisational, and academic tasks, as well as the organization of theoretical and practical training, is overseen by the Teacher Training Centre. Each institution may establish one teacher training centre for this purpose.

As of [July 2023](#), certain STEM teacher training programmes have become available, structured as short-cycle training lasting 2 or 4 semesters. These programmes cater to individuals who have already obtained a Master's degree in a relevant discipline and wish to pursue a teaching degree in that field. For instance, a biologist seeking to attain a biology teaching qualification could enrol in such a programme.

[Specialised training programmes](#) are available to enhance professional skills in STEM Education Outside the Classroom (EOC), including roles such as museum pedagogue, zoo-pedagogue, or

outdoor programme manager. These programmes typically follow completion of a 2 or 4 semester study in the relevant field.

Continuing professional development (CPD) for teachers underwent significant reform with the amendment of the Public Education Act in 1996. This amendment mandated compulsory participation in in-service training lasting 120 hours every 7 years.

Various methods are employed for teachers to fulfil their in-service training requirements, with failure to do so potentially resulting in sanctions. Non-compliance may lead to termination of employment for teachers who have not completed their training obligations.

In-service training programmes for teachers, accredited by the Education Authority, are provided by the state as part of a professional teaching service and are free of charge. These programmes are conducted by Pedagogical Educational Centres with territorial competence. However, there are also private providers offering accredited training for a fee.

### Micro credentials

Several European countries, including Hungary, the Netherlands, Slovenia, and Spain, are currently conducting [pilot schemes](#) for micro credentials to evaluate their integration into national education systems. However, many of these initiatives rely on temporary funding and lack a dedicated, continuous source of financial support. This underscores the necessity of exploring sustainable methods of financing micro credentials.

University administration underwent reforms in specific areas. In December 2022, an amendment to the [Higher Education Act](#) introduced micro credentials, which higher education institutions will be mandated to issue for any single course or module upon students' request.

Moreover, leveraging funding from the Recovery and Resilience Facility (RRF), Hungary launched diverse initiatives in 2022 aimed at modernising higher education. These initiatives include policy proposals and regulatory recommendations regarding the integration of micro credentials. Leading this effort is a consortium comprising the Hungarian Rectors' Conference, the Hungarian Higher Education Accreditation Committee, and the Education Authority.

Furthermore, Hungary is assessing the feasibility of establishing a unified national framework for micro credentials to ensure lifelong traceability. The conditions for issuing and storing micro credentials online are defined by the Adult Training Law. Plans are in progress for a comprehensive implementation of micro credentials across various educational levels. The RRF will support a pilot project for micro credentials in higher education, with funding from the 2021-2027 Digital Renewal Operational Programme Plus allocated for similar initiatives in VET and higher education, including digital competence development training leading to micro credentials.

In Hungary, several universities have spearheaded the provision of [micro credential courses](#). The inaugural cohort consists of 600 individuals who have enrolled in micro courses, with 19 courses offering micro credentials along with digital content.

Two universities were scrutinised as case studies. [Dennis Gabor University](#) provides eight micro credential courses encompassing topics such as IT, project management, product design, and

business. Each course carries a value of 3 ECTS credits, with an estimated cost of 600 EUR per course.

[Szechenyi Istvan University of Gyor](#) has launched micro credential courses centred on IT, law, and innovation. Of particular significance is a training programme financed by the NTP-STEM-23 grant, offered at no cost to participants. This training aims to instruct gifted STEM girls aged 13-14 and 15-18 in robotics and programming, with the goal of refining problem-solving and logical-algorithmic thinking abilities.

Testimonials from Hungarian participants are available in the [MicroHE](#) project. MicroHE - Challenges and Opportunities of Micro-Credentials in Europe is an analysis aimed at identifying the principal methodological and operational challenges in acknowledging micro credentials, both for academic recognition and employment purposes. The target interviewees were divided into four distinct categories: students, teachers, employers, and decision-makers.

*“The 4<sup>th</sup> industrial revolution changes the way we live, work, learn, communicate, relate, etc. Hence it will be crucial to have new forms of recognition and validation. The validation system also needs to be changed.”* and

*“We can’t just adopt new things in old infrastructures.”* say interviewees from Hungary.

The transition towards the implementation of micro credential systems has evidently begun, with pioneering initiatives already underway. The first micro credential courses have been developed and are now accessible in Hungary as well, eliciting a discernible positive sentiment towards micro credentials among the individuals interviewed.

## Eco-schools

The [Hungarian Eco-School Network](#) was inaugurated in 2000 through the collaborative efforts of institutions dedicated to sustainability education. The designation of Eco-School is bestowed by the Hungarian government upon public education institutions that demonstrate a notable commitment to sustainability education within their pedagogical programmes, surpassing curricular requirements.

Valid for three years, the Eco-School title is conferred via an online application process to institutions that champion sustainability values and themes both within and beyond the classroom, exemplified by the personal conduct of teachers and the environmentally conscious operation of the institution. Schools achieving the title for the third time attain the status of Eco-Schools for Life. Sustainability has been integrated into the teacher certification system. As of 2023, over 1400 eco-schools have been established in Hungary, representing approximately one-third of all schools in the country.

This network operates independently of the international [eco-schools overseen by FEE](#).

## Certified Forestry Forest Schools

A forestry forest school represents an educational and awareness-building institution situated within forest environments, utilising forest pedagogy under the supervision of a forest manager. These schools are classified based on the comprehensiveness, quality, and quantity of their programmes, as well as any additional services they provide.

The certification of [Forestry Forest Schools](#) is administered by the [National Forestry Association](#), which employs a [standardised set of criteria](#) to ensure consistent evaluation and certification. Certification is awarded for a period of four years, with the option for renewal. Across five regions of Hungary, there are over 30 such schools in total. Despite being termed "schools," these institutions do not form part of the national education system. Rather, they serve as physical learning sites and are not involved in the operation of a formal schooling system.

Eco-school networks therefore still mean a potential entry point for changes that would further emphasise EOC, and potentially make further steps towards a harmonised certification system, however their openness to extend, adjust, refresh their manifestos, processes and standards needs further investigation, with careful consideration to respecting locally well working practices and diversity.

Eco-school networks thus represent a promising avenue for advancing the prominence of Education Outside the Classroom (EOC) and potentially progressing towards a harmonised certification framework. However, their receptiveness to expanding, adapting, and revitalising their charters, procedures, and quality standards remain additional scrutiny. Such an examination should be conducted with due regard for the preservation of effective local practices and the acknowledgment of diversity within these networks.

# Recommendations



## 7 OTTER recommendations towards high-quality Education Outside the Classroom in Europe

In the pursuit of fostering high-quality Education Outside the Classroom initiatives across Europe, it is imperative to outline a set of recommendations that can serve as guiding principles for stakeholders involved in the educational landscape.

The OTTER recommendations aim to ensure that EOC courses, school networks, programmes and activities adhere to rigorous standards of quality assurance, facilitate meaningful learning experiences, and contribute to the meaningful development of learners.

Addressing a wide array of stakeholders, including STEAM teachers, EOC practitioners, schools, higher education institutions (HEIs), education providers, prospective eco-schools, non-governmental organizations, researchers, and policymakers, these recommendations are designed to promote collaboration, innovation, and excellence in EOC practices.

By aligning efforts and resources towards implementing these recommendations, Europe can take significant strides towards fostering a highly educated, environmentally sustainable, and inclusive society.

### Policy makers should

#### 1. Promote micro credential systems across Europe

Support the legislative recognition of micro credentials issued by Higher Education Institutions and other education providers, particularly in the realm of Education Outside the Classroom. Especially relevant for teacher training, where the diverse entry points and degrees allow for a modular structure and need flexibility at the same time.

#### 2. Foster the internationalization of eco-schools

Allocate funds for bottom-up initiatives that promote EOC initiatives, such as joint projects, student exchanges, and specialised teacher training programmes focused on environmental sustainability. By strengthening international collaborations and partnerships, eco-schools will multiply their efforts and efficiency range, and may lead to harmonized increase of quality, environmental literacy.

#### 3. Provide opportunities for EOC Labels

Support the development of upcoming label systems in the field of EOC to enhance quality assurance and recognition especially in non-formal and informal education. Labels would provide clear and trustworthy information about EOC programmes and activities, their widespread adoption would serve as quality assurance in STEAM education.

#### **4. Initiate a European-wide EOC Task Force**

This task force should be dedicated to harmonising information exchange, capacity-building efforts, and the development of common standards, fostering collaboration and innovation in education across the continent.

#### **5. Reward teachers acquiring micro credentials**

Encourage the recognition and reward of teachers who undertake additional responsibilities through the acquisition of micro credentials. This acknowledgment should extend beyond moral appreciation to include financial incentives, thereby providing tangible support for educators investing in their professional development. By valuing and incentivising the pursuit of micro credentials, teachers are motivated to enhance their skills and expertise in EOC, ultimately contributing to the overall improvement of educational standards.

#### **6. Integrate EOC into curricula**

Research findings and OTTER pilots underscore the manifold advantages of EOC for students, teachers, and educational effectiveness. Integrating it into national and local curricula constitutes an investment in the future of education and sustainability.

#### **7. Nurture existing communities of practice**

Foster environments conducive to formative assessment and encourage bottom-up initiatives to flourish within these communities, preserving the core educational philosophy of EOC. Avoid imposing overly formalized structures of accreditation that could detract from the organic growth and collaborative spirit of these communities. Such measures will sustain the authenticity and effectiveness of EOC initiatives while promoting continuous improvement and innovation.

### **Policy makers and researchers should**

#### **8. Support further research and development on the benefits of EOC**

Allocate resources and opportunities to support research and professional development in the field of EOC. Conduct research to study the benefits EOC and its potential in enhancing learning. As OTTER research showcased, students' aspirations for scientific careers were not as easily measured in OTTER project. It is necessary therefore, to support longer periods of study, allocations for extended intervention and collecting longitudinal data.

#### **9. Support further research and actively seek synergies with sister projects**

A comprehensive multilevel analysis of the results of sister projects funded within the same scheme is essential for shaping future research agendas and charting a pragmatic path forward. Through systematic evaluation of results of sister projects and further collaboration opportunities identified in OTTER, valuable insights into the emerging fields of STEAM education and EOC accreditation could be gained. This analysis should not only highlight knowledge exchange opportunities among projects but also facilitate progress towards a harmonised vision in accreditation in the EU.

## Researchers and EOC professionals should

### 10. Include gender dimension in the research content

Make gender part of the research design and systematically controlled for throughout the research process without necessarily being the main focus of analysis. Integrating the gender dimension involves questioning gender norms and stereotypes, investigating genders' needs, attitudes and behaviours. In addition to enhancing the societal relevance of the knowledge produced, it leads towards a more equitable education in general.

### 11. Engage in policy analysis to examine the regulatory frameworks and policies governing accreditation in EOC programmes

Researchers can identify gaps, inconsistencies, and areas for improvement in existing policies, thereby informing policy development and reform efforts to enhance accreditation practices.

### 12. Continue to engage in empirical research and evaluation studies to further explore the effectiveness, impact, and quality of EOC programmes

This involves developing and implementing assessment frameworks and tools to evaluate the relevance, coherence, and outcomes of such programs. By generating evidence-based insights into their effectiveness, researchers contribute to the ongoing development of comprehensive accreditation standards. Moreover, comparative analyses of accreditation frameworks across diverse settings can be conducted to identify best practices and inform the refinement of contextually relevant accreditation guidelines. Through these research endeavours, researchers play a crucial role in advancing our understanding of the value and impact of education outside the classroom, ultimately contributing to the enhancement of accreditation practices in this domain.

## HEIs and other Education providers should

### 13. Integrate EOC into courses

Integrate EOC into educational courses, whether as a component of STEM curricula, thereby becoming an integral part of degree programmes, or through short courses leading to the attainment of micro credentials. By embedding EOC within formal educational frameworks, students can gain valuable experiential learning opportunities while acquiring recognised qualifications. This integration not only enriches the educational experience but also enhances the relevance and applicability of learning outcomes, preparing individuals for real-world challenges.

### 14. Integrate OTTER results into micro credential courses

OTTER achieved a range of results, all available open source, as reference or basis for further development. Structuring courses by using the OTTER approach benefits in-service, future teachers and EOC practitioners, moreover, permits first-hand experience to stimulate further development on the field.

## STEAM teachers, EOC practitioners and schools should

### 15. Use the self-assessment Rubrics provided by OTTER for quality assurance

The OTTER self-assessment Rubrics are designed with built-in flexibility to accommodate the diverse landscape of EOC in Europe. They provide a) matrix of parameters to support the self-assessment of EOC implementers, b) clear set of indications about the quality consideration schools/practitioners need to make before embarking on EOC actions (i.e., support to beginners); and c) guidance on potential developments for advanced implementers who are willing to pursue a sustainable progressive development.

### 16. Use the three OTTER pillars - sustainability, inclusion and 21<sup>st</sup> century skills - as framework for developing classes, curricula, eco-school programmes

The positive impact potential of this framework includes support to the achievement of a) climate neutrality by the year of 2050 which is the main goal of the European Green Deal; b), a gender equal and inclusive society and c), equipping students with the skills required to keep up with the pace of developments in the modern world.

### 17. Use the OTTER Lab approach

Implement the OTTER Lab approach, which facilitates comprehensive knowledge acquisition through experiential learning. This structured approach operates on a 5-step cycle: Preparation, Orientation, Discovery, Youth initiative, and Reflection. Evidence from pilots underscores the importance of incorporating pre- and post-learning activities to sustain long-term impact and enhance learning outcomes. By adopting this approach, educators can foster deeper engagement and facilitate meaningful learning experiences for students.

### 18. Make use of the OTTER toolkit

The toolkit is designed to facilitate innovative class planning for EOC. It consists of three parts, namely (1) gives practical advice on how to start EOC, (2) how to manage OTTER Labs outside the classroom and (3) showcase best practices in EOC from Europe. The toolkit offers a wealth of resources and practical advice for teachers, practitioners and schools alike.

## Present and prospective eco-schools should

### 19. Seek out existing eco-school networks or establish new ones as promoters of EOC

Given the alignment of eco-schools' objectives with EOC principles, existing networks demonstrate a commitment to sustainability, likely employing relevant practices. Initiate network establishment or join networks at regional or national levels, with potential expansion to international platforms for enhanced collaboration and network resilience.

### 20. Seek collaboration opportunities with functional adjunct networks

These can be networks, associations and initiatives with a range of practical knowledge to meet your functional needs, such as outdoor associations. Synergies and specific collaborations can be established and leveraged on for further development at different levels.

## NGOs should

### 21. Advocate for EOC Labels

Promote the establishment, implementation, and development of EOC Labels, ensuring that they are tailored to accommodate national specificities while maintaining consistent quality standards. By advocating for EOC Labels, NGOs can contribute to the standardization and recognition of high-quality education initiatives across Europe, thereby facilitating access to enriching learning experiences for students and promoting environmental sustainability.

## 8 References

Cedefop (2022). Microcredentials for labour market education and training: first look at mapping microcredentials in European labour-market-related education, training and learning: take-up, characteristics and functions. Luxembourg: Publications Office. Cedefop research paper, No 87. <http://data.europa.eu/doi/10.2801/351271> [https://www.cedefop.europa.eu/files/5587\\_en.pdf](https://www.cedefop.europa.eu/files/5587_en.pdf)

Charles, Cheryl & Keenleyside, Karen & Chapple, Rosalie & Kilburn, Bill & Leest, Pascale & Allen, Diana & Richardson, Miles & Giusti, Matteo & Franklin, Lawrence & Michael Harbrow, & Wilson, Ruth & Moss, Andrew & Louise Metcalf, & Camargo, Luis. (2018). Home to Us All How Connecting with Nature Helps Us Care for Ourselves and the Earth. [https://www.researchgate.net/publication/330980975\\_Home\\_to\\_Us\\_All\\_How\\_Connecting\\_with\\_Nature\\_Helps\\_Us\\_Care\\_for\\_Ourselves\\_and\\_the\\_Earth](https://www.researchgate.net/publication/330980975_Home_to_Us_All_How_Connecting_with_Nature_Helps_Us_Care_for_Ourselves_and_the_Earth)

European Commission, European Education and Culture Executive Agency, Balcon, M., Nikolova, S., Teachers' and school heads' salaries and allowances in Europe 2021/2022, Balcon, M.(editor), Publications Office of the European Union, 2023, <https://data.europa.eu/doi/10.2797/764821> <https://op.europa.eu/en/publication-detail/-/publication/4b900c13-6977-11ee-9220-01aa75ed71a1/language-en>

OECD (2023), "Micro-credential policy implementation in Finland, the Slovak Republic, Slovenia and Spain", OECD Education Policy Perspectives, No. 86, OECD Publishing, Paris, <https://doi.org/10.1787/c3daa488-en> [https://www.oecd-ilibrary.org/education/micro-credential-policy-implementation-in-finland-the-slovak-republic-slovenia-and-spain\\_c3daa488-en](https://www.oecd-ilibrary.org/education/micro-credential-policy-implementation-in-finland-the-slovak-republic-slovenia-and-spain_c3daa488-en)

OECD (2023), "Micro-credentials for lifelong learning and employability: Uses and possibilities", OECD Education Policy Perspectives, No. 66, OECD Publishing, Paris, <https://doi.org/10.1787/9c4b7b68-en> [https://www.oecd-ilibrary.org/education/micro-credentials-for-lifelong-learning-and-employability\\_9c4b7b68-en](https://www.oecd-ilibrary.org/education/micro-credentials-for-lifelong-learning-and-employability_9c4b7b68-en)

OECD (2020), TALIS 2018 Results (Volume II): Teachers and School Leaders as Valued Professionals, TALIS, OECD Publishing, Paris, <https://doi.org/10.1787/19cf08df-en> [https://www.oecd-ilibrary.org/education/talis-2018-results-volume-ii\\_19cf08df-en](https://www.oecd-ilibrary.org/education/talis-2018-results-volume-ii_19cf08df-en)

### WEB REFERENCES

<https://activeschoolflag.ie/>

<https://brigitsgarden.ie/forest-school-leadership/>

<https://education.ec.europa.eu/education-levels/higher-education/inclusive-and-connected-higher-education/bologna-process>

<https://education.ec.europa.eu/education-levels/higher-education/inclusive-and-connected-higher-education/european-credit-transfer-and-accumulation-system>

<https://education.ec.europa.eu/education-levels/higher-education/inclusive-and-connected-higher-education/diploma-supplement>



<https://education.ec.europa.eu/education-levels/higher-education/micro-credentials>

<https://education.ec.europa.eu/education-levels/school-education/erasmus-teacher-academies>

<https://ehea.info/>

<https://escolesxesc.cat/>

<https://europa.eu/europass/en>

<https://europa.eu/europass/en/europass-digital-tools/european-qualifications-framework>

<https://europa.eu/europass/en/europass-tools/european-qualifications-framework/national-qualifications-frameworks>

<https://eurydice.eacea.ec.europa.eu/national-education-systems/hungary/overview>

<https://eurydice.eacea.ec.europa.eu/national-education-systems/ireland/overview>

<https://eurydice.eacea.ec.europa.eu/national-education-systems/spain/overview>

<https://felveteli.sze.hu/mikrotanositvanyok>

<https://forestschoollireland.ie/about/>

<https://gde.hu/mikrotanositvanyt-nyujto-kepzes>

<https://greenschoolsireland.org/apply/>

<https://koulujaymparisto.fi/in-english/>

[https://kti.krtk.hu/wp-content/uploads/2022/02/A\\_kozoktatas\\_indikatorrendszer\\_2021.pdf](https://kti.krtk.hu/wp-content/uploads/2022/02/A_kozoktatas_indikatorrendszer_2021.pdf)

<https://microcredentials.eu/>

<https://microcredentials.eu/wp-content/uploads/sites/20/2019/12/WP3-Interviews-with-Key-Stakeholders-Decision-Makers-Overall-Summary-Report.pdf>

<https://microcreds.ie/>

<https://miriadax.net/>

<https://net.jogtar.hu/jogszabaly?docid=a1200283.kor>

<https://njt.hu/jogszabaly/2011-204-00-00>

<https://okm.fi/en/frequently-asked-questions>

<https://op.europa.eu/webpub/eac/education-and-training-monitor-2023/en/country-reports/hungary.html#1-teaching-profession>

<https://otter-project.eu/learning-platform/toolkit>

[https://politikatudomany.tk.hu/uploads/files/Pedagoguskutatas\\_gyorsjelentes.pdf](https://politikatudomany.tk.hu/uploads/files/Pedagoguskutatas_gyorsjelentes.pdf)

<https://ppk.elte.hu/content/muzeumpedagogus-kepzes-a-ppk-n.t.38871>

<https://tieke.fi/en/micros-macros-and-badges-skills-for-working-life/>

<https://vihrealippu.fi/en/>

<https://web.gencat.cat/en/temes/educacio/index.html>

<https://www.antisce.org/education>

<https://www.aqu.cat/en/>

<https://www.cedefop.europa.eu/en/tools/nqfs-online-tool/countries/finland-2020>

<https://www.citizensinformation.ie/en/education/the-irish-education-system/overview-of-the-irish-education-system/>

<https://www.enqa.eu/>

<https://www.enqa.eu/esg-standards-and-guidelines-for-quality-assurance-in-the-european-higher-education-area/>

<https://www.eqar.eu/about/annual-reports/2022-2/contributing-to-the-development-of-the-ehea/>

<https://www.fee.global/>

<https://www.iua.ie/>

<https://www.mab.hu/en/procedures/>

[https://www.mab.hu/wp-content/uploads/6.-Laura-Sinoros-Szabo\\_KIM\\_final.pdf](https://www.mab.hu/wp-content/uploads/6.-Laura-Sinoros-Szabo_KIM_final.pdf)

<https://www.miteco.gob.es/es/ceneam/recursos/mini-portales-tematicos/esenred/redes-escolares-sostenibilidad.html>

<https://www.nala.ie/wp-content/uploads/2019/08/A-short-guide-to-accreditation.pdf>

<https://www.oecd.org/publication/pisa-2022-results/country-notes/finland-6991e849/>

<https://www.oecd.org/publication/pisa-2022-results/country-notes/ireland-01173012/>

<https://www.oecd.org/publication/pisa-2022-results/country-notes/spain-f1a3afc1/>

[https://www.oktatas.hu/kozneveles/pedagogiai\\_szakmai\\_szolgaltatasok/fenntarthatosagra\\_neveles/okoiskolak\\_Magyarorszagon](https://www.oktatas.hu/kozneveles/pedagogiai_szakmai_szolgaltatasok/fenntarthatosagra_neveles/okoiskolak_Magyarorszagon)

[https://www.oktatas.hu/kozneveles/pedagogiai\\_szakmai\\_szolgaltatasok/fenntarthatosagra\\_neveles](https://www.oktatas.hu/kozneveles/pedagogiai_szakmai_szolgaltatasok/fenntarthatosagra_neveles)

<https://www.qqi.ie/>

<https://www.teachingcouncil.ie/assets/uploads/2023/08/ceim-standards-for-initial-teacher-education.pdf>

<https://www.teachingcouncil.ie/assets/uploads/2023/08/procedures.pdf>

<https://www.una-europa.eu/study/microcredential-sustainability>



<https://www.unesco.org/en/aspnet>

<https://www.versnellingsplan.nl/Kennisbank/pilot-microcredentials-2/>



## 9 OTTER References

McCormack, O & O'Neill, D. (2021). Outdoor Science Education for a Sustainable Future: Gender Strategy. University of Limerick, Ireland.

McCormack, O., O'Neill, D., Beal, E., Azevedo, N., González, H., Jarvinen-Taubert, J., Kajganovic, J., Kurucz, O., Marimon, O., Rusitoru, M. and. Valtonen, P (2022). D2.1 Literature Review and Compendium of Successful Practice the H2020 project OTTER (Outdoor Science Education for a Sustainable Future). Limerick, Ireland. 156 Pages.

Marimon, O., Gonzáles, H., Jarvinen-Taubert, J., & Valtonen, P. (2022). D3.3 Guidelines to develop OTTER outdoor labs. Barcelona, Spain. 35 pages.

Azevedo, N. H., Avraamidou, L., Rusitoru, M., McCormack, O., & Kajganovic, J. (2022). D4.1 Monitoring and Evaluation Framework of the H2020 project OTTER (Outdoor Science Education for a Sustainable Future). Groningen, Netherlands. 38 pages.

Azevedo, N.H., Ioannou, M., Avraamidou, L., O'Neill, D. (2023). D4.2 Methodologies for monitoring and evaluation of project processes - Collaboration and partnership processes. Project OTTER (Outdoor Science Education for a Sustainable Future). Groningen, The Netherlands. 36 pages.

O'Neill D., McCormack O., Kelly R., Azevedo N.H., (2023). D4.3. Methodologies for Monitoring and Evaluating Students' Scientific Knowledge and 21st Century Skills. Ireland. pp.49.

O'Neill, D., Azevedo, N.H., McCormack, O., & Kelly, R. (2024). D4.4. Report on integrated analysis of process and outcome data across all participating countries, including a comparison of student performance across gender and geographical location variables. University of Limerick, Ireland. 122 pages

Azevedo, N. H., Avraamidou, L., O'Neill, D., Rusitoru, M. (2023). D5.1 EOC accreditation in Europe: a mapping study. OTTER Project. Groningen, Netherlands. 94 pages.

Monos, C., Khenkin, S., Kray, Zs., Ipolyi, I., Tambakis, A. (2023). D5.2 A Protocol for Quality Assurance to Inform the Accreditation Process of the H2020 project OTTER (Outdoor Science Education for a Sustainable Future). Nicosia, Cyprus. 70 pages.

Järvinen-Taubert, J., Valtonen, P., (2023). D5.3 Final OTTER toolkit – adapted final version. Tampere, Finland. 39 pages.

Kelly R., O'Neill D., McComarck O., Azevedo N. H., Kray Zs. (2024). 5.4 Practical Recommendations for Assessment Methods. Ireland. 48 pages.

## 10 Annex

### Formal, non-formal, and informal education

Distinctions as per the [Council of Europe](#) between formal, non-formal, and informal education is crucial for several reasons. Firstly, it helps educators and policymakers tailor educational approaches to different contexts and learner needs. It can be observed in the list below that the type of learning significantly influences the extent to which assessment and, consequently, accreditation is possible.

Educational systems are designed to facilitate **formal** learning, characterized by a structured syllabus and intentional activities where the primary goal is learning. Assessments, including tests and other evaluation methods, are employed to measure learning outcomes.

**Non-formal** learning occurs beyond traditional educational settings but still within an organizational structure. It stems from a learner's deliberate choice to master a specific skill, activity, or knowledge area, representing an intentional and self-directed effort. Unlike formal learning, it does not necessarily adhere to a prescribed syllabus or involve external accreditation and assessment.

**Informal** learning takes place outside the walls of schools and emerges when learners engage in activities without a specific learning goal. Informal learning is involuntary and an inescapable part of daily life. Through the RVAC process, competences gained in informal learning can be made visible, and can contribute to qualifications and other recognitions.



© Cottonbro

## Contact



[www.otter-project.eu](http://www.otter-project.eu)



[@otter\\_euproject](https://www.instagram.com/otter_euproject)



[@OTTER\\_EU](https://twitter.com/OTTER_EU)

