**Educating the Educators IV**

**International Conference on approaches to scale-up professional development in STEM education**

**STEM & Open Schooling for
Sustainability Education**

******May 11-12, 2023, Naturalis Museum Leiden,
the Netherlands**

**Call for proposals**

Dear Colleagues,

We are pleased to send you this call for proposals for our upcoming international conference: Educating the Educators III – approaches to scale-up professional development in science, technology, engineering and mathematics (STEM) education, with the conference theme **STEM & Open Schooling for Sustainability Education**. This conference follows on the great success of the first, second and third conference that we hosted on this topic in 2014, 2016 and 2019. Almost 200 researchers, policy makers and practitioners participated in these three conferences, where together we identified the need to continue working on professional development for educators in mathematics and science education.

The conference board welcomes contributions to this event in 2023. We invite you to submit proposals for research, practice or policy-oriented paper presentations, posters and workshops to be given during the conference as well as stands for the material market.

The conference is hosted by Naturalis Leiden and Utrecht University in collaboration with the International Centre for STEM education ([www.icse.eu](http://www.icse.eu)) and the project MOST - Meaningful Open Schooling connects Schools To Communities ([www.icse.eu/most](http://www.icse.eu/most)). The project MOST has received funding from the Horizon 2020 program of the European Union (Project number 871155).

**Plenary events:**

Keynote by Arjen Wals, Professor Transformative Learning for Socio-ecological Sustainability/Unesco Chair at Wageningen University & Research, Netherlands.

Keynote by Marta Romero Ariza & Katja Maaß, Partners in the MOST-Project reporting on European experiences with school-community projects on environmental issues.

A round table discussion on the complexity of all perspectives in pathways to sustainability.

**Location:** Naturalis museum, Leiden, Netherlands (<https://www.naturalis.nl/en>)

The **deadline** for submission of proposals (paper presentations, interactive sessions, posters) is **4th December 2022.**

To submit your proposal and for regularly updated information about the conference, please visit <https://icse.eu/educating-the-educators/>. We are looking forward to receiving your contributions and to seeing you at the conference. With kind regards, the conference board:

*Prof. Dr. Katja Maaß, ICSE, University of Education, Freiburg, Germany*

*Dr. Michiel Doorman, ICSE Consortium & Utrecht University, Netherlands*

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# 1. Conference overview

## 1.1 Aims and dimensions

EtE IV is an international conference on professional development in mathematics and science education that brings together teacher educators, policy makers, teachers and various other stakeholders related to STEM education.

EtE IV will focus on implementing and scaling up innovative teaching approaches in STEM education and in particular on open schooling initiatives with respect to environmental issues (such as waste reduction, plastics, energy reduction/transition and increasing electricity needs for clouds and bitcoins). The aim is to discuss different approaches with a rich variety of participants on three dimensions:

* **Personal dimension**: Which roles and ways of working have to be considered in the professional development courses for PD course leaders and facilitators in professional learning? In particular, what do need teacher educators to support teachers in running open schooling projects? What do teachers need for being involved in open schooling initiatives on environmental issues?
* **Material dimension**: Which role can materials play in professional development for mathematics and science teachers, such as classroom materials, materials for students and community members (such as brainstorming templates), face-to-face and online materials? In particular what materials do teachers need to run open schooling projects?
* **Structural dimension:** What structures are needed for implementing and sustaining open schooling initiatives, such as school-community projects, on environmental issues?

## 1.2 Target groups

Teachers, teacher educators and researchers, course leaders and relevant networks, teacher professional development (PD) centers, mathematics, science and STEM education support centers, presidents and representatives of PD institutions, teacher associations and relevant networks, as well as policy makers in the field of mathematics and science education.

## 1.3 Conference formats

The conference will use both traditional and innovative formats to help bring out the specific benefit of gathering a circle of participants from research, practice and policy. Vivid exchange and collaborative work will be ensured by spaces for co-creation and for sharing ideas and results:

* poster sessions and oral presentations to report on projects, approaches and research.
* workshops and co-design spaces actively involving participants in particular in co-creation on environmental issues.
* a materials market allowing participants to exhibit interesting professional development materials, classroom materials, co-creation templates, and learn about other materials.
* plenary events including key lectures and a round table on an environmental issue that involves various stakeholders and perspectives.

Particular conference features will be:

* a policy seminar on overcoming challenges in scaling-up teacher PD – researchers and practitioners engage in mutual exchange with policy makers
* co-creation formats to collaboratively work on an environmental issue to model potential ways of working in schools and using open schooling strategies for sustainability education.

# 2. Organisational structure of the conference

## 2.1 Conference chairs

Katja Maaß, ICSE, University of Education, Freiburg, Germany

Michiel Doorman, ICSE Consortium & Utrecht University, Netherlands

## 2.2 Program committee

The program committee will support the conference chairs with scientific and conceptual advice when selecting proposals to assure a high relevance and scientific quality of the conference and possible subsequent publication(s). Members of the program committee are:

Ragnhild Lyngved, Josette Farrugia, Marta Romero Ariza, Maria Evagorou, Jesper Boesen, Gultekin Cakmakci, Martin Bilek, Danielle Meuleman, Bettina Rösken-Winter, Christine Knippels, Anna Shvarts, Sabine Mickler.

## 2.3 Organisation committee

Danielle Meuleman, Michiel Doorman, Monica Wijers, Vincent Jonker, Sanne Korte, Heather Huijting, Chrissi Fischer, Berit Stier.

## 2.4 Venue and accommodation

The conference will be held at Naturalis museum Leiden, Netherlands. Leiden is easy to reach with international trains. If travelling to the conference by plane, nearby airports are *Amsterdam Schiphol Airport* (direct train connection from the airport, about 10 min to Leiden) and *Rotterdam The Hague Airport* (about 1 h with public transport).

The conference board will try to arrange a contingent of reserved rooms at hotels in Leiden for participants. When successful, we will provide a list of hotels with such contingents at the time of the registration deadline on the conference website <https://icse.eu/educating-the-educators/>. Please note: participants are responsible for making and paying for their own travel and accommodation arrangements.

## 2.5 Registration & fees

You must register to attend the conference. The registration form will be available on September 2022 on the conference website <https://icse.eu/educating-the-educators/>.

The fee to attend the conference will amount to approximately € 150.

## 2.6 Important dates

**Submission of papers, posters and contributions for the materials market: from September, 1st 2022 until December, 4th 2022**

**Author notification: December 2022**

**Conference registration begins: September 2022**

# 3. Conference topics in details

We kindly invite you to submit your proposal(s) addressing one or more of the following dimensions of educating educators for innovation in STEM education. The personal dimension refers to the roles and pedagogies involved in teacher education. The materials dimension refers to the resources needed for supporting these pedagogies and specific ways of working. The structural dimension refers to the structures needed for implementing and sustaining innovative approaches to STEM education.

## Topic 1: Personal dimension

This topic will address roles and ways of working have to be considered in the professional development courses for PD course leaders and facilitators in professional learning. In particular, what competences (including knowledge, beliefs, values, practices and skills) should be taken into consideration to successfully support teacher professional development (TPD) about open schooling STEM and sustainability education? What do teacher educators need to support teachers in running open schooling projects? What do teachers need for being involved in open schooling initiatives on environmental issues?

Roles in the educating the educators perspective involve two models of professional development approaches. In the *pyramid model,* engaged teachers or researchers are qualified to become *course leaders*, who then go on to support other teachers in PD courses. In the second model, teachers themselves organize *professional learning communities,* that might involve external experts, for instance to perform lesson studies and reflect on implementing innovative approaches in their school context(s). Contributions in this topic are expected to examine both models and aim to – amongst others – draw links between them.

Current awareness of the importance of open schooling and addressing environmental issues in science education also challenges considerations related to content, curriculum and specific target or age groups. Open schooling, school-community projects (SCPs) and environmental issues require interdisciplinary approaches that also involve ethics and various stakeholders and perspectives. How to prepare (future) teachers for these approaches? What can these activities contribute to learning science and mathematics? How to ensure attention for subject structure, and to what extent is this subject structure conditional for productive involvement in SCPs and tackling environmental issues? We invite contributions for the conference that address these questions on the level of classroom practices and for pre- and in-service teacher education.

The evolving perspective on roles for teachers, teacher educators and the school curriculum also impacts the pedagogies needed. What are strategies for facilitating and guiding open schooling initiatives? How to productively involve parents and stakeholders in school-community projects? What are strategies for co-creation? We invite contributions that explore these questions and in particular focus on ways to address them in pre- and in-service education.

## Topic 2: Material dimension

Carefully designed classroom tasks and materials are powerful tools for enhancing the quality of mathematics and science teaching, influencing the classroom culture and fostering students’ learning. In the process of developing a task culture and implementing good material in classrooms, a *spiral model* of professional development has proven to be efficient and effective within various projects (e.g. EU projects PRIMAS, MASCIL and MASDIV). In the spiral model, teachers actively experience the innovative approaches in continuing cycles of analysis – implementation – reflection. After gaining some experience, professional learning communities are able to develop their own tasks. This process ensures shared ownership of tasks, and thereby facilitates their use.

In this topic we in particular focus on the role materials can play for students and community members when being involved in school-community projects on environmental issues such as templates for brainstorming and co-creation, materials for outdoor investigations (including online tools like <https://litterati.org/>), and for exchanging results with community members.

Furthermore, professional development in the *spiral model* requires appropriate materials designed for a learning community’s facilitator or course leader to use with their work with teachers. These PD materials can also be realized in the form of e-learning materials, as innovative technologies enable new approaches and powerful possibilities for collaborative, learner-centered and research-oriented learning with flexible access.

## Topic 3: Structural dimension

When aiming at improving STEM education and preparing schools for their future roles, new structures on various levels are needed. This topic will focus in particular on structures needed for implementing and sustaining open schooling initiatives on environmental issues. On the classroom level, these structures refer to the ways of working and sharing of responsibilities in classroom practice. On the school level the structure orients towards the way the curricula, meetings with students and activities of teachers are organized. On the regional or national level, structures impacting classroom practice relate to the role of high stake assessment and ways by which policy is involved in professional development of teachers and supporting school development.

We invite representatives of large-scale projects and initiatives that aim at scaling-up the implementation of innovative, research-based approaches to STEM education and will take into account their contextual framing (such as curriculum, assessment, relation between policy and professional development, school context). In particular we invite projects to present their findings when they addressed the implementation of Open Schooling in STEM education, or sustainable awareness for environmental issues in schools on a regional or (inter)national level.

# 4. Proposal submission information

## 4.1 Overview on formats with call for submissions

Proposals for active participation to the conference can be submitted for the following formats:

* Sharing ideas and results
	+ oral presentations reports on projects, approaches and research
	+ interactive poster sessions
	+ materials market allowing participants to exhibit and share interesting professional development materials (including classroom materials)
* Co-creation spaces
	+ workshop sessions actively involving all participants
	+ co-design spaces

Please carefully read the submission guidelines to ensure meeting the requirements for each of the formats.

The conference aim is to provide a platform for exchange among research *and* practice on the successful implementation of innovative teaching concepts and experiences on and with ‘educating the educators’, scaling up of professional development, and with open schooling in STEM education on environmental issues.

## 4.2 Submissions for oral presentations

We welcome oral presentations of research-based papers, as well as practical reports or demonstrations (e.g. a simulation of a professional development situation, demonstration of materials, demonstration of e-learning support platforms).

Your proposal should outline:

1. How it relates to the overall conference theme,
2. From which perspective (e.g. country-specific, target group-specific) it will address the topic, and
3. The content of your planned presentation/input.

Proposals should be precise, and include sufficient details and references for a critical review. Please keep in mind when planning/writing your proposal that it should also address the underlying purpose of promoting innovative science and mathematics learning and connections with open schooling and environmental issues in particular.

The length of the proposal must be **two pages**, including some references, excluding a cover page. A template will be provided at the website <https://icse.eu/educating-the-educators/>.

Deadline for submission will be **December 4th, 2022**.

The program committee will review all submissions.

Authors will be notified in **December, 2022**.

## 4.3 Submissions for workshops and co-creation

We welcome proposals for workshops or co-creation spaces which actively involve participants. Workshops provide opportunities for participants to experience already designed classroom or PD materials for teachers or teacher educators. Co-design spaces provide an opportunity for the participants to get involved into an idea-in-progress, to get feedback from various stakeholders such as teachers and policy makers and other representatives, to explore feasibility and adjust the design of proposed ideas by role-playing and direct tryouts.

Emphasize in your proposal the question or problem that participants will work on and the way of working that they will experience. We will try to create much time in the program for these co-creation sessions. Please be aware that during such a session of 30-60 minutes (depending on the number of submissions) you will not have time for an extensive presentation.

Your proposal should outline:

(1) How it relates to the overall conference theme,

(2) The content and subject matter of your planned session including the main problem and ways of working by the participants, and

(3) The aim and relevance of your session.

Proposals should be precise, and include sufficient details and references for a critical review. Please keep in mind when planning/writing your proposal that it should also address the underlying purpose of promoting more meaningful and motivating science and mathematics learning.

During this conference we like to move beyond traditional present-and-listen formats with a large number of interactive sessions using formats like innovation labs, design thinking, hackathons and co-creation on environmental challenges.

The length of the proposal must be **two pages**, including some references, excluding a cover page. A template will be provided at the website <https://icse.eu/educating-the-educators/>.

Deadline for submission will be **December 4th, 2022**.

The program committee will review all submissions.

Authors will be notified in **December, 2022**.

## 4.4 Submissions for interactive poster presentations

All guidelines for oral presentation submissions apply for poster submissions as well. Professional development and support centers are particularly invited to present their work using posters (the conference will ensure that a platform for exchange among such institutions is provided).

A poster proposal is expected to outline:

1. How the poster relates to the overall conference theme,
2. The work to be presented on the poster (who, what, why),

You should prepare your poster for presentation at the conference in portrait format – and we strongly suggest using at minimum A1.

The length of your poster proposal should not exceed **two pages**. You may use one additional page for such items as diagrams, figures and references etc. A template will be provided on the conference website <https://icse.eu/educating-the-educators/>.

Deadline for submission will be **December 4th, 2022**.

The program committee will review all submissions.

Authors will be notified in **December, 2022**.

## 4.5 Submissions for the Materials Market

A materials market will allow attendees to look into a broad range of PD materials and classroom materials supporting PD in the area of STEM, Open Schooling and Environmental Issues exhibited by European projects, educators and PD course participants.

The materials market will continue as an open exhibition and forum for all conference participants. An accompanying poster exhibition will display current developments in teacher professional development in STEM education.

If you want to participate in this market as an exhibitor, please send in the following information:

* What kind of materials (PD materials and classroom materials supporting PD) you will present (focus, subjects, background, specific features or aims, designer/owner, languages available, etc.) (materials must be primarily in English).

Please also let us know:

* Whether your materials are available online, e.g. through the Scientix database, and the amount of materials (would you need one or two tables of 100 cm x 60 cm).

Your contribution (first draft of abstract and above questions answered) should be sent to ete2023@uu.nl by **31st January 2023**. Please refer to “materials market” in your e-mail. Please forward this call to teachers, teacher educators, teacher associations, Professional Development Centers and European projects in the area of STEM.

A committee will review all submissions. Authors will be notified in **February 2023**.

# 5. Conference hosts

## 5.1 Naturalis Biodiversity Center

Naturalis is the Dutch research institute for biodiversity. In the award-winning museum (European Museum of the Year 2021) we show the beauty of nature. Through our impressive collection, knowledge and data, we record all life on Earth. This is important, as our future depends on biodiversity. Everything in nature is connected, and balance is vitally important for its continued existence. We research nature in order to preserve biodiversity. This is how we contribute to solutions for major, global issues involving climate, living environment, food supply and medicine.

## 5.2 Utrecht University – Freudenthal Institute

The Freudenthal Institute (FI) aims to contribute to high-quality education in mathematics and the natural sciences through education, research and professionalization. The FI is part of the Faculty of Science at Utrecht University, and consists of science didactic research groups, the History and Philosophy of Science (HPS) department, U-Talent and the Teaching & Learning Lab (TLL).

## 5.3 MOST

Our H2020 project MOST (2020-2023) opens up formal science education and establishes partnerships between schools and their communities (families, science education providers, citizens, businesses etc.). Together they work on environmental school-community-projects (SCPs) with a thematic focus on waste management and energy saving. These participatory projects directly respond to the needs and values of those involved, benefitting the community as a whole and making schools agents of community well-being. MOST’s learning impact is boosted through an educational research-based approach that raises interest in science, scientific literacy and environmental responsibility.

To realize this powerful Open Schooling idea, our consortium gathers 23 expert teams from 10 European countries, including science education research and science teaching staff from higher education institutes, schools, non-formal learning providers, educational authorities, civic organizations, municipalities and enterprises.

To initialize the school-community-projects our consortium provides support for schools in form of preparatory workshops, potential partner search activities and through provision of operational and pedagogical instructions. Activities on the local, regional and European level foster the sharing of knowledge, establishing further partnerships and mainstreaming MOST results across Europe.

The core of the project is the integration of diverse participants: science and research, formal and non-formal educational institutions, politics, economy and society – on a local level by cooperating within “Open Schooling” projects, as within the project consortium, which contains all named institutions. The cooperation of diverse participants is the prerequisite to develop solution approaches, which take the needs of all concerned parties into consideration. At the same time, this is a driver for innovation, which will motivate all participants, to commit in the long term.

All participants and supporters of the MOST project form the European Open Schooling Network (EOSnet), which will be enlarged step-by-step all over Europe into a vibrant Open Schooling community network.

## 5.4 ICSE & ICSE Consortium

The International Centre for STEM Education (ICSE) is located at the University of Education in Freiburg, Germany and focuses on practice-related research and its transfer into practice. ICSE sustainably links stakeholders from research, practice, policy and industry, nationally as well as internationally through the ICSE consortium.

The ultimate aim of ICSE is to help improve STEM education across Europe. That is, to give students insights into authentic features of STEM subjects and their connection to real-life contexts, to raise achievement levels in STEM subjects and to make science literacy accessible to all students, regardless of gender and cultural or socioeconomic backgrounds. Thereby, ICSE intends to promote the interest of young people in STEM careers.

The **ICSE Consortium was founded in 2017 and endeavors to lead the field of transfer-oriented research and development in STEM education**. It wants to set standards for a **high-impact international collaboration of higher education and research institutes.** The consortium is comprised of the following 16 research institutes:

* Austria, University of Innsbruck
* Austria, University of Klagenfurt
* Bulgaria, Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences
* Cyprus, University of Nicosia
* Czech Republic, Charles University
* Germany, International STEM Centre, University of Education Freiburg
* Germany, Leibniz Institute for Science and Mathematics Education (IPN) in Kiel
* Greece, National and Kapodistrian University of Athens
* Lithuania, Vilnius University
* Malta, University of Malta
* Netherlands, Utrecht University
* Norway, Norwegian University of Science and Technology
* Slovak Republic, Constantine the Philosopher University in Nitra
* Spain, University of Jaén
* Sweden, Jönköping University
* Turkey, Hacettepe University