

Report on ICSE Academy Final Conference

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| | PP=Restricted to other program participants (including the EC) |
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TABLE OF CONTENTS

| | |
|-----------------------------------------------------------------------------|-----------|
| 1. EXECUTIVE SUMMARY | 1 |
| 2. INTRODUCTION | 2 |
| 2.1. The keynotes | 3 |
| 2.2. The Final ICSE Academy Policy Round Table | 7 |
| 2.3. Dissemination of ICSE Academy at ETE V with workshops and oral session | 9 |
| 2.4. The Teachers' Day | 11 |
| 2.5. Poster session | 11 |
| 3. CONCLUSION | 12 |
| 4. APPENDIX I. EVALUATION OF THE CONFERENCE | 13 |

1. EXECUTIVE SUMMARY

The ICSE Academy Final Conference was held on May 8–9, 2025, in Limassol, Cyprus, in conjunction with the 5th Educating the Educators (ETE V) Conference. This joint event provided a unique opportunity to disseminate outcomes of the ICSE Academy project and foster dialogue among over 120 stakeholders including STEM teachers, researchers, policymakers, and teacher educators across Europe. The conference aligned with the key themes of diversity, digital transformation, interdisciplinarity, and sustainability in STEM education. It featured high-impact keynotes by Jonathan Osborne, Anastasios Hovardas, and Hilda Borko, each addressing critical dimensions of STEM education—from scientific literacy and pedagogical design to the preparation of professional development leaders.

Additional highlights included the Final Policy Round Table on STEM teacher mobility, with participation from key European stakeholders and representatives of other Erasmus+ Teacher Academies, as well as targeted dissemination activities such as workshops, oral presentations, and poster sessions led by ICSE Academy partners. A special Teachers' Day provided dedicated content on open schooling, sustainable STEAM learning, and teaching in the age of AI. These sessions created space for rich interaction between teachers, researchers, and students. The conference successfully served as a platform for knowledge sharing, professional growth, and the development of future-oriented strategies for STEM teacher education across Europe.

2. INTRODUCTION

The ICSE Academy Final Conference took place on May 8-9th 2025 in Limassol, Cyprus and was organised in parallel to the 5th Educating the Educators Conference. ETE V is organised every two years and the four main tracks of the ETE conference during 2025 were: (a) diversity in STEM education, (b) STEM education in the digital era, (c) interdisciplinarity in STEM education and (d) sustainability and STEM. All four tracks align with the work in the ICSE Academy project, and especially the work that was developed for the European workshop series. Therefore, ETE V was the ideal platform, especially since this conference attracts teachers, educators and researchers from across Europe who are interested in innovations in STEM education. The [ETE V conference and the ICSE Academy Final Conference](#) took place on May 8-9, 2025 in Limassol, Cyprus at the St Raphael Hotel and were hosted by the University of Nicosia in collaboration with the International Centre for STEM education. More than 120 teachers, teacher trainers, researchers and policy makers participated in workshops, oral presentations, poster sessions, a Teachers' Day on the first day of the conference, and the final policy round table. Specifically, 129 participants registered for the conference, and 121 signed the participant list during the days of the conference (37 male and 84 female). The ICSE Academy final conference took place in parallel to the ETE V on both May 8th and 9th and included three keynotes by Jonathan Osborne, Anastasios Hovardas and Hilda Borko. Furthermore, the conference featured the final policy round table on STEM teacher mobility with the participation of policy makers and researchers from other Erasmus+ Teacher Academies. The full program of the conference is available here: <https://educating-the-educators.icse.eu/schedule/> with the parallel session of the ICSE Academy conference labelled separately.

The conference opened with brief introduction from the conference chair, Prof. Maria Evagorou from the University of Nicosia, introducing the conference and ICSE Academy, and was followed up with a brief introduction by Oliver Strasers, and Laura Wanckel, ICSE, University of Education, Freiburg who introduced the idea behind the ETE

conferences, but also the ICSE consortium. The workshops and short oral presentations were used by project partners to disseminate findings from the ICSE Academy project, and also to disseminate training materials developed for the European Workshop Series. The workshops actively involved participants in on issues related to diversity in STEM education, STEM education in the digital era, interdisciplinarity in STEM education and sustainability and STEM and exchange of ideas between teachers and researchers. The Teachers' Day on the first day of the conference was dedicated on issues that are considered as important and of interest to the students and included a panel discussion on open schooling in which a group of secondary school students and their teacher presented their work on STEM and opening up schools, a workshop on creating sustainable STEAM learning, and a panel discussion on Teaching in the age of AI. Finally, a social event also took place during the evening of the first day of the conference which included a cultural tour of the city and a dinner with a cultural activity. The social event was plant in a way that would create an interactive activity between the participants of both the ETE V conference and the ICSE Academy Conference.

2.1. The keynotes

The conference was opened with a plenary talk by Jonathan Osborne from Stanford University focusing on scientific literacy in the 21st century. The talk focused on the critical importance of developing students' capabilities to evaluate scientific information, a central aspect of scientific literacy. It emphasized that this competency was directly aligned with the 2025 PISA framework, which includes the ability to "research, evaluate and use scientific information for decision making and action." Similarly, the NGSS highlighted the practice of "obtaining, evaluating and communicating information" as a key scientific skill. In the context of the current Age of Misinformation, the speaker pointed out that most existing science standards—developed over a decade ago—were not designed to address the widespread nature of misinformation. Although scientific literacy was a feature of these standards, they lacked the tools needed to help students critically assess information. The talk argued for a crucial distinction between evaluating the *source* of scientific information and

evaluating its *content*. Since only expert scientists are typically equipped to assess content, it was proposed that science education should instead place more emphasis on teaching students how to evaluate sources. In the presentation, the foundational knowledge and competencies required for this purpose were explored, and potential changes to science standards were discussed. The ideas presented were closely connected to the competencies assessed in PISA 2025 and was closely aligned with the goals of the ICSE Academy project on preparing educators for STEM education.



Photo 1. Jonathan Osborne during first plenary talk

The second plenary talk was by Anastasios Hovardas from the University of Cyprus on the use of learning products to align pedagogical design, implementation and assessment in STEM and STEAM Education. Several persistent challenges in teacher training and professional development were addressed in this talk, especially the limitations of existing practices and solutions. These included: (1) the shift from a focus on content to skills, which elevated the task of engaging with content critically for both

teachers and students; (2) the need for integrated STE(A)M learning, requiring the inclusion of multiple STEM disciplines alongside arts, humanities, and social sciences; and (3) the rise of open-ended learning environments marked by uncertainty and unpredictability. It was argued that these challenges could not be met through traditional, linear pedagogical approaches, externally imposed assessment tools, or centralized leadership structures. The session examined how learning products—tangible outputs created by students during learning activities—can serve as a focal point for aligning pedagogical design, implementation, and assessment in STE(A)M education. Through selected examples, the speaker showcased the potential of pedagogical design in Inquiry Learning Spaces and demonstrated how participatory design processes could be structured with input from stakeholders in open schooling projects. A detailed coding process was presented for evaluating the quality of learning products, along with strategies for using these insights in peer and formative assessment. The talk concluded with a discussion of the implications for open-ended learning contexts such as educational robotics and Makerspaces, and for the development of a European STE(A)M Roadmap and Competence Framework, aligned with initiatives like DigCompEdu, GreenComp, and EntreComp.



Photo 2. Anastasios Hovardas during second plenary talk

The final plenary talk took place on the last day of the conference by Hilda Borko from Stanford University and focused on preparing and supporting professional development leaders. The increasing demand in recent years for professional development (PD) opportunities for teachers was addressed, along with the need for scalable, sustainable programs led by a broad base of well-prepared PD facilitators. To respond to these challenges, the speaker presented the *Learning to Facilitate Framework* (LTFF), a model developed by researchers from Germany, Israel, and the United States to support the preparation of PD facilitators. The LTFF outlined four core pedagogies: selecting a central task of facilitating PD, representing the practices within that task, approximating those practices, and unpacking both the representations and approximations. To illustrate the framework in practice, the speaker analyzed a facilitator preparation session from their research on the *Problem-Solving Cycle* model, which centers on leading video-based discussions. The talk concluded by exploring how both the Problem-Solving Cycle and the LTFF could be used to design and study facilitator PD, with particular attention to strategies for promoting diversity and equity in mathematics classrooms.



Photo 3. Hilda Borko during final plenary talk

The description of all plenary talks, and a short interview with the speakers after the end of their talk, focusing on their reflections from their interactions with the participants are available here: https://educating-the-educators.icse.eu/plenary_talks/

2.2. The Final ICSE Academy Policy Round Table

The third and final ICSE Academy Policy Round Table took place during the last day of the conference, on May 9th and focused on a panel discussion, a world cafe, a presentation of mobilities from different EU funded projects and a final discussion and summary. The topic of the round table was Teacher Mobility in STEM Education and was organised by the University of Nicosia (UNIC) as the work package leader. This in-person round table built on two previous online round tables and brought together key stakeholders from education, government, academia, and industry. The aim was to explore the current landscape of STEM teacher mobility across Europe, identify

challenges and opportunities, and propose concrete policy recommendations and practical strategies to enhance mobility and professional growth for STEM educators.

Maria Evagorou and Marta Romero-Ariza, but partners from the ICSE Academy project opened the round table, with an introduction on the actions that took place during the ICSE Academy project that are linked to teacher mobility, and a brief presentation of the outcomes of ICSE Academy related to STEM teacher mobility. A panel discussion followed, with contributions from Agueda Gras-Velazquez, from the European Schoolnet, Verena Bodenbender, International Office Pädagogische Hochschule Freiburg, Maria Podlasek-Ziegler, from DG EAC – European Commission, Brussels and Gregory Makrides, STEAME Teacher Academy Coordinator/University of National Education Commission, Krakow, Poland. The panel addressed questions related to the current state of STEM teacher mobility, including how existing policies support or hinder mobility, and how barriers such as certification, funding, and institutional structures impact mobility efforts.

A World Café session followed, moderated by partners of the ICSE Academy and enabled participants to dive deeper into these themes in small group discussions. *The groups discussed key questions such as: How does mobility affect STEM education outcomes? What are the implications for teacher retention and professional development? What policy and institutional measures could support teacher mobility? and How can technology and digital platforms promote cross-border collaboration among teachers?* Summaries of these discussions were shared in plenary, and posters were created to capture participants' insights.

In the part of the round policy table, Michiel Doorman (ICSE Academy), Gregory Makrides (STEAME Academy), Natalia Spyropoulou (SPICE Academy), and Mirjam Holtkemper (NBS4S) shared best practices from their respective projects, highlighting successful models of teacher mobility and their impact. The event closed with reflections by the organisers. Overall, the round table, which featured 40 participants plus the presenters, fostered rich dialogue, collaborative problem-solving, and actionable policy recommendations for advancing STEM teacher mobility in Europe.





Photo 4: The panellists from the policy round table and part of the world cafe

2.3. Dissemination of ICSE Academy at ETE V with workshops and oral session

The first day of the 5th International Conference on STEM Teacher Education showcased a wide range of engaging sessions, with several significant contributions from the ICSE Academy that reflected its ongoing work in promoting innovative and collaborative approaches to STEM education across Europe. Among the ICSE Academy-affiliated workshops, *“Fostering Teacher Collaboration Across Europe: Insights, Challenges, and Future Directions”* led by Martin Bilek, Janka Medova, Despina Potari, and Stefan Zehetmeier, explored strategies for building stronger teacher networks and enhancing cross-border professional learning. Another session, *“STEM Out-of-School Activities to Learn, to Observe and to Protect”*, presented by Vincent Jonker, Gultekin Cakmakci, Martin Bilek, and Lucas Weinberg, emphasized the importance of experiential and community-based learning in STEM, offering practical ideas for integrating real-world experiences into education. The workshop *“Connecting Critical Thinking to STEM Content”*, delivered by Michiel Doorman, focused on how critical thinking can be meaningfully embedded within STEM curricula, equipping students with analytical tools to navigate complex problems. Complementing this, the session titled *“Transversal Topics or Transversal Skills?”* presented by Matija Basic, Martin Bilek, Michiel Doorman, and Josette Farrugia, addressed the role of cross-cutting skills in modern STEM education, sparking dialogue around how these can be effectively taught and assessed.



Photo 5: Photos from workshops from ICSE Academy

These contributions from the ICSE Academy enriched mainly the first day of the conference, offering participants insights into collaborative practices, interdisciplinary learning, and the integration of transversal skills in STEM education. Oral presentations from the ICSE Academy were also included as part of the ETE V conference. Sardag, Kaya, Sogut, and Cakmakci presented a case study on professional development training for both pre-service and in-service STEM teachers. Abril, Martín-Peciña, Quesada, and Ariza examined efforts to enhance teacher self-efficacy in diverse STEM classrooms through targeted professional development. Konstantinidou and Evagorou presented a systematic review of empirical studies that analysed the outcomes of programs shaped by STEM reforms and policies, that was part of the policy workpackage of the project. Triantafillou, Nikolaidou, Potari, and Psycharis explored how sustainability awareness was supported through the design of green mathematical tasks. Bogiatzi, Chatziandreou, and Verykios investigated an interdisciplinary approach that integrated mathematics and biology teaching. Finally, Triantafillou and Gosdis studied STEM interdisciplinary activities within a carpentry laboratory, emphasizing the practical application of STEM concepts.

2.4. The Teachers' Day

The Teachers' Day took place on May 8th 2025, during the first day of the conference, and it was specially designed for teachers but was also open to teacher educators, researchers and policy makers. The Teachers' Day featured three sessions which provided a combination of panel discussions and a workshop. The first session focused on opening up schools to the real world and featured a panel with teachers, researchers and students who talked about the benefits of opening up the school from their perspectives and shared their experiences and challenges. A group of students from a secondary school in Limassol presented a project they completed during the current academic year, and teachers commented on their experiences. The second session planned under Teachers' Day was an interactive workshop presented by Stephanos Cherouvis from Ecsite (European Network of Science Centres and Museums). During the workshop participants explore six evidence-informed criteria for high-quality STEAM practices, developed through the EU-funded Road-STEAMer project and engaged in a gallery walk, reflected on your own practices, and took part in a hands-on activity distinguishing sustainability from exploitation. Finally, the last session under Teachers' Day was a panel discussion on teaching in the age of AI with a panel including researchers and teacher educators presenting ideas and challenges from implementing AI in their teaching, and closing with a keynote input by Scientix on a European perspective on STEM education and AI.

2.5. Poster session

The poster session for both conferences was organised on the first day of the conference, May 8th 2025 in the afternoon and included twenty four poster presentations both from the ICSE Academy and the ETE V conference as well. The full program of the conference can be found here: <https://educating-the-educators.icse.eu/schedule/> and is also included in Appendix II.

3. CONCLUSION

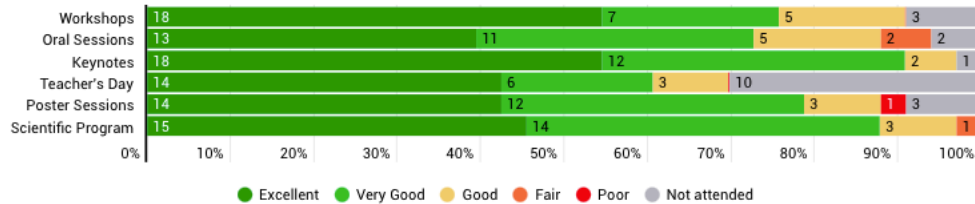
The ICSE Academy Final Conference marked the completion of a three-year European collaboration aimed at transforming professional development for STEM educators. The event showcased the project's contributions to policy, practice, and research in STEM education through engaging formats and inclusive participation. The keynotes, round table discussions, workshops, and poster sessions demonstrated the project's alignment with European educational priorities, especially in promoting teacher mobility, fostering cross-disciplinary collaboration, and addressing 21st-century challenges such as misinformation, sustainability, and digitalization. Through its active engagement with stakeholders and its integration with the broader ETE V community, the conference not only celebrated the achievements of the ICSE Academy but also laid the groundwork for continued European collaboration in teacher education. The outcomes of the conference—including policy recommendations, training materials, and best practices—will contribute to sustaining the impact of the ICSE Academy and advancing innovative and inclusive STEM education across Europe and are available through the project's website here: <https://icse.eu/icse-academy/>

4. APPENDIX I. EVALUATION OF THE CONFERENCE

An online survey was shared with all conference participants through email. The main outcomes of the evaluation are shown below.

Session Formats and Quality

This section presents the results of our post-conference survey, focusing on the quality and effectiveness of various session formats. Attendee feedback provides valuable insights into which formats were most impactful.



What the participants enjoyed



I found very interesting a lot of the presentations, I was inspired with new ideas, but most of all I enjoyed exchanging opinions with fellow participants all over the world, especially during workshops.

I liked the diversity of the themes that were dealt with at the conference and the ease of networking during breaks and even during the events. I think you really did a wonderful job!

The fact that we could talk about tasks and things happening inside the classrooms not only in research

Opportunity to meet and engage with a variety of educators that I don't normally encounter

I especially liked the workshop format, which offered more opportunities to discuss and deepen the topics presented by the workshop organizers. In addition, the sessions with the keynote speakers were really interesting.

I greatly appreciated the thoughtful integration of research presentations alongside practical field implementations. The event was intellectually enriching and professionally valuable, with meaningful opportunities for collegial interaction. The balance between academic content and social engagement was particularly commendable. I am profoundly grateful for the opportunity to participate in this distinguished gathering. Thank you for facilitating such an exemplary conference experience.

Suggestions



I would like to respectfully suggest considering allocating additional time for transitions between sessions. I would appreciate the inclusion of round table discussions on scientific education topics, as these would facilitate valuable dialogue and knowledge exchange among conference participants.

A 5-10 minutes gap between following sessions; so that we have a bit of time to reach the next session/workshop/room.

Include a closing ceremony

I would suggest higher frequency, so that we can assess the effects of working on stem projects at schools.

The workshops should be always in your priority it was great opportunities for interactions

Participant Experience

Venue

The event took place at St. Raphael Resort in Limassol. One plenary room and 5 parallel rooms were used for the needs of the conference.



Relevant Comments

I particularly like the world cafe session

Honestly, I can't think of anything to improve.



Social Events

The excursion included Limassol Marina, the Old Town, and a conference dinner at a traditional tavern featuring local food and music.

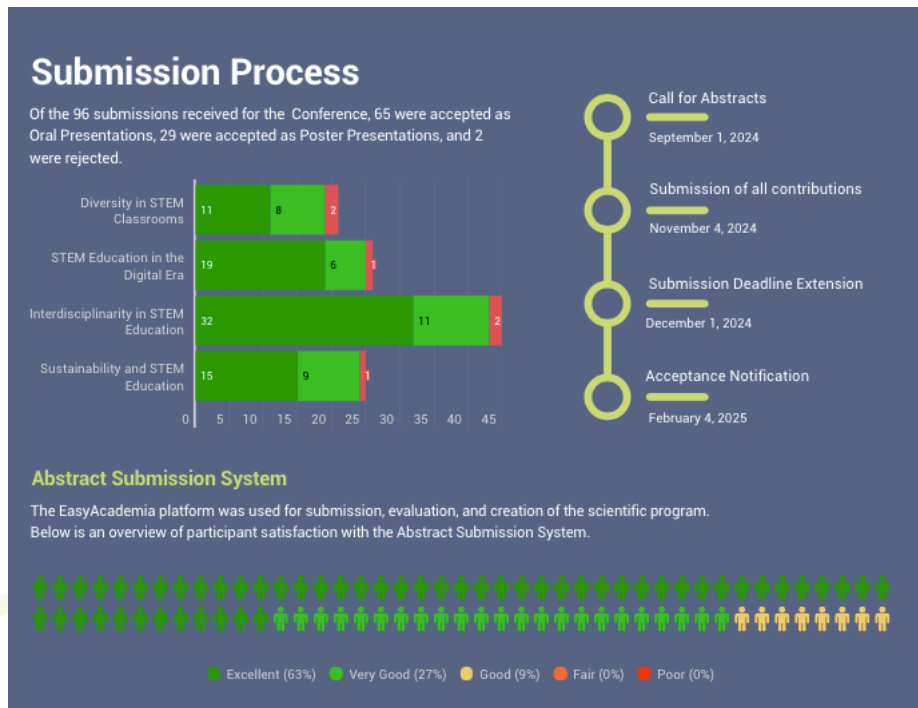


Overall Satisfaction

Below are the survey results reflecting participants' feedback on the overall quality of the conference, its value for money, and the inclusiveness of the experience.



5. APPENDIX II. SUBMISSION, SELECTION AND REGISTRATION



Registrations

The symposium brought together 120 academics, researchers, students, and industry practitioners from across 26 countries, all engaged in the rapidly evolving fields of Education.

