

ESERA 2021 Strands

List of ESERA 2021 Strands

1. Learning Science: Conceptual Understanding

Theories, models, and empirical results on conceptual understanding, conceptual change and development of competences; methodology for investigating students' processes of concept formation and concept use; strategies to promote conceptual development.

*Strand Chairs: **Ana Sofia Afonso & Massimiliano Malgieri***

2. Learning Science: Cognitive, Affective, and Social Aspects

Cognitive, affective, and social dimensions in learning science. Design of in-school and extra school learning environments and study of teaching/learning processes. Representational languages and knowledge organisation. Collaborative construction of knowledge.

*Strand Chairs: **Florence Le Hebel & Vanessa Kind***

3. Science Teaching Processes

Relations between teaching practices and students' cognitive and affective development, design of teaching interventions. Research based intervention and its role for curriculum planning, instructional paths and learning outcomes. Laboratory-based practice. Video studies in science education.

*Strand Chairs: **Sabine Fechner & Dimitris Stavrou***

4. Digital Resources for Science Teaching and Learning

Design, evaluation and characterization of resources and environments for teaching/learning science: ICT and TEL in science education. Online learning environments, simulation and modelling tools, virtual laboratories. Self-regulation, reflection and collaboration in digital learning environments.

*Strand Chairs: **Jesper Bruun & Jesper Haglund***

5. Teaching-Learning Sequences as Innovations for Science Teaching and Learning

Design of teaching and learning materials. Classroom implementation, refinement and evaluation of teaching sequences. Exchange and adaptation of teaching-learning sequences. Adoption and transformation of teaching materials. Factors that influence teacher ownership.

*Strand Chairs: **Italo Testa & Nikos Papadouris***

6. Nature of Science: History, Philosophy and Sociology of Science

The implications of nature of science, its history, philosophy, sociology and epistemology, for science education. The significance of models and modelling for science education as reflected in the particular importance attached to the use of metaphors, analogy, visualization, simulations and animations in science.

*Strand Chairs: **Ebru Kaya & Veli-Matti Vesterinen***

7. Discourse and Argumentation in Science Education

Understanding, supporting and promoting use of evidence and argumentation discourse in science education. Scientific practices related to knowledge evaluation and communication. Supporting the development of critical thinking. Discourse analysis. Talking and writing science in the classroom. Meaning making in science classrooms.

*Strand Chairs: **Kalyso Iordanou & Maria Andrée***

8. Scientific Literacy and Socio-scientific Issues

Teaching about scientific literacy, science and citizenship education, science and media education, information literacy, informal reasoning and critical thinking, decision making, debates on socio-scientific issues (SSI), discourse communities, social dimension of science and techno-scientific practices, public engagement in science, schools', students' and teachers' engagement in socio-scientific issues.

*Strand Chairs: **Antti Laherto & Eliza Rybska***

9. Environmental, Health and Outdoor Science Education

Ecological and Environmental Education, Education for Sustainable Development, environmental health, health education and health promotion. Lifestyles and attitudes towards health and the environment. Developing and evaluating the impact of programmes and experiences outside classrooms, including those organized by institutions other than schools.

*Strand Chairs: **Albert Zeyer & Justin Dillon***

10. Science Curriculum and Educational Policy

Curriculum development. Reform implementation, dissemination and evaluation. International comparison studies such as TIMSS and PISA. Evaluation of schools and institutions. Policy and Practice issues: local, regional, national, or international issues of policy related to science education.

*Strand Chairs: **Eilish McLoughlin & Odilla Finlayson***

11. Evaluation and Assessment of Student Learning and Development

Development, validation and use of standardized tests, achievement tests, high stakes tests, and instruments for measuring attitudes, interests, beliefs, self-efficacy, science process skills, conceptual understandings, etc.; authentic assessment, formative assessment, summative assessment; approaches to assessment. Monitoring student learning and implications for teaching.

*Strand Chairs: **Lukas Rokos & Mathias Ropohl***

12. Cultural, Social and Gender Issues in Science and Technology Education

Equity and diversity issues: Sociocultural, multicultural, bilingual, racial/ethnic, gender equity studies and science education for the special needs.

*Strand Chairs: **Lucy Avraamidou & Allison Gonsalves***

13. Pre-service Science Teacher Education

Professional knowledge of teachers, pre-service teacher preparation, instructional methods in pre-service teacher education, programs and policy, field experience, relation of theory with practice, and issues related to pre-service teacher education reform.

*Strand Chairs: **Maria Evagorou & María Ruth Jimenez Liso***

14. In-service Science Teacher Education, Continued Professional Development

In-service science teacher education, teachers as lifelong learners; methods, innovation and reform in professional development; evaluation of professional development practices, reflective practice, teachers as researchers, and action research.

*Strand Chairs: **Claudio Fazio & Pedro Reis***

15. Early Years Science Education

Emergent science, science pedagogy and learning in the early years, cognitive resources for science learning, early years science and technology curriculum, innovative teaching practices in the early years, children's learning, preschool science, early years teacher education in science.

*Strand Chairs: **Bodil Sundberg & Christina Siry***

16. Science in the Primary School

Procedural skills in science, science investigations, science teaching and learning sequences.

*Strand Chairs: **Anna Spyrtou & Federico Corni***

17. Science Teaching at the University Level

University pedagogy. Teaching and learning at the university level.

*Strand Chairs: **Jenaro Guisasola & Paula Heron***

18. Methodological Issues in Science Education Research

Aspects of epistemology, ontology and axiology.

*Strand Chairs: **Marianne Odegaard & Shulamit Kapon***