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Introduction: Strand 8 Scientific Literacy and Socio-scientific Issues

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The “post-truth” era and the growing realization of the global sustainability crises are both refocusing research and practice in science education worldwide. Abilities for scientific argumentation and contributing to value-based change have been emphasized more and more as important aims of school science. These developments underline and give new considerations to the ESERA Strand 8: Scientific Literacy and Socio-scientific Issues.

Socio-scientific issues (SSI's) have already gained ground in science curricula worldwide and proven successful in rendering science education more relevant for tackling the emerging sustainability issues. According to the research in the field, SSI's can make science learning relevant to students, promote critical thinking and value-laden dialogue, and elaborate the nature of science and the complex connections between science, technology, society and environment. New interpretations of *scientific literacy* (SL) have also emerged: 'Vision III' stresses that science education should prepare students not only to understand the role of science and informed decision-making in the society but also to question the societal choices and values on the basis of ethical consideration and take action to bring about desirable change. Both domains of the strand, SSI and SL, seem to provide crucial and desirable aspects for creating a responsible and reflective society. At the same time, both domains concern a wide spectrum of human life – from everyday situations to difficulties in making important decisions (that for some may resemble the Trolley problem). SSI's and SL call for an interdisciplinary approach from researchers due to the fact that they deal with moral and ethical questions and values.

The eleven papers from Strand 8 in this proceedings capture the diversity of topics and research approaches within the field of SSI's and SL. Both new and already established orientations to SSI's and SL are manifested in the following papers.

The first two papers focus on informal and nonformal science learning venues, which provide crucially important settings for fostering scientific literacy and sustainability education. *Annika Roskam*, *Kai Bliesmer* and *Michael Komorek* analyse the educational offerings for climate change education provided by out-of-school learning venues. Research on citizen science projects, providing adults with opportunities to work with scientists and

vice versa, have remained under-theorised and therefore *Till Bruckermann* and colleagues propose a heuristic model for designing and evaluating citizen science projects.

The strand 8 contribution includes three papers focusing on SSI-related matters in pre-service primary school teacher education. *Athanasia Kokolaki* and *Dimitris Stavrou* employed SSI and Nature of Science approaches in primary school teacher training to negotiate aspects of the EU concept of Responsible Research and Innovation. The paper by *Lida Desikou*, *Athina Koutsianou* and *Anastassios Emvalotis* focuses on how teacher students' epistemic cognition influences how they deal with a SSI. Thirdly, Southern European pre-service teachers' opinions about circus with animals were investigated by *António Almeida*, *Beatriz García Fernández* and *Penelope Papadopoulou*.

School-industry collaboration and the development working-life skills are, also, increasingly important issues for SSI-based education. Prospective teachers' perceptions of the various benefits of collaboration between schools and industry were mapped in *Špela Hrast's* and *Vesna Ferik Savec's* questionnaire study. The paper by *Luisa López-Banet*, *Cristina Ruiz González* and *Enrique Ayuso Fernández* surveyed the biotechnology knowledge of Spanish students at the end of their secondary education. *Tomotaka Kuroda* addressed educational needs posed by working life by conducting a comparative study in Japan and the Republic of Malawi on higher education students' views of the abilities associated with STEM communities.

Finally, three papers investigated students' SSI-related views. To lay the groundwork for SSI-based instruction, *Sayuri Tokura* and colleagues investigated Japanese primary school students' abilities to recognise and consider other people's diverse cognitive and emotional viewpoints. In the research project reported by *Laurence Schmitz* and *Christiane S. Reinert*, an educational tool called "decision diary" was evaluated in supporting students' abilities to identify situations for everyday decision-making. Finally, *Bruna Herculano da Silva Bezerra* and *Edenia Maria Ribeiro do Amaral* present a study on how students apply their common sense and scientific knowledge when discussing SSI's in various contexts.