Editorial

by Marie-Christine Knipps & Frans van Dam, PARRISE coordinators
Freudenthal Institute, Utrecht University, The Netherlands

After over three years of preparations and two one-year rounds of testing, the PARRISE project is now ready to deliver: this was the unanimous conclusion of the 18 partners from 11 countries during their 2017 project meeting in Toulouse, France, from May 9 to May 12. PARRISE combines socio-scientific issues and citizenship education with inquiry-based science education, in training of both pre-service and in-service teachers. This approach, known as the “Socio-Scientific Inquiry-Based Learning” approach (SSIBL), is now being taught to teachers in all participating countries, from Estonia to Portugal and from the UK to Israel.

In the final months of the project, the dissemination of the SSIBL approach and materials will be the partners’ most prominent activities, thus maximizing the possibility for the sustainability of this approach. The partners will share their experiences in teacher professional development events nationally and via the project website. A special toolkit for teacher trainers is in preparation. In addition, the project will provide classroom materials for teachers.

The conclusion is that the SSIBL approach meets its main objective: integrating the idea of Responsible Research and Innovation (RRI) in science teaching. For those who want to know more, visit the project website (www.parrise.eu).

On August 20th, the outcomes of the project will be discussed at the PARRISE final conference in Dublin, Ireland. Visitors can participate in roundtable discussions and workshops, illustrating how the PARRISE approach was integrated in the classroom and in teacher training. Moreover, plenary panel sessions will discuss the road ahead and question how these activities could be continued. The conference is expected to be well-attended, as the number of reservations for the conference had already reached the maximum number of 150 by the end of June. Visit the PARRISE Final Conference webpage for updates on this important event (www.parrise.eu/parrise-final-conference).

How to use artefacts in stimulating authentic questions? How to trigger questions in students by visiting a supermarket? And how to deal with moral dilemmas in the classroom? These are a few of the activities that participants in the PARRISE final conference in Dublin on August 20th, can experience themselves. In addition, there will be workshops and lectures about organizing a culture of teacher professional development and collaborations with schools on the topic of climate change. In a workshop titled “Arguments in motion”, participants can explore their personal viewpoints on an ethical dilemma by choosing their position in the room. For more up-to-date information about the PARRISE conference final program see this page.

Registration is now closed, as we have received more than 150 applications on a first-come, first-served basis. If you are interested in participating, please add your name to our reserve list and you will be contacted if a position opens up. We hope to see you there!
From 9 to 12 May 2017, the 18 partners of the PARRISE project met at the "École Nationale Supérieure de Formation de l’Enseignement Agricole" (ENSFEA), in Toulouse, France, to discuss their progress with the Teacher Professional Development (TPD) programs in the 11 participating countries.

Partners shared their experiences with the second round of their TPDs, based on the PARRISE theoretical framework. Their objective was to learn from each other’s experiences, as well as to identify cross-cutting themes on the strengths, weaknesses, and challenges related to the TPDs. At the meeting, special attention was also paid to discussions about the evaluation of the TPDs, as well as about the dissemination of the PARRISE TPDs and student materials through the PARRISE good practices database. The meeting concluded with a discussion about the organization of the PARRISE final conference on August 20th in Dublin.

**PARRISE workshops at Malmö University**

*Malmö University, Sweden*

Malmö University has collaborated with researchers from different fields during their teacher professional development courses. By bringing together researchers from science, science education and technology, the aim was to problematize teaching in an area such as nanotechnology, which is an example of a scientific area in development on the edge of science, with a constantly changing and developing knowledge base. In this way, the TPD team wanted to increase the possibility of understanding the integrated framework of SSIBL with a special focus on RRI.

The participants in the TPD were firstly exposed to a pro-nano perspective by listening to a podcast by Prof. Maria Strömme, who emphasized the many possibilities this technology may open in the future. This was followed by a lecture delivered by researcher Christina Isaxon from Lund University, concerning the risks of nanotechnology. Isaxon problematized the fact that almost all resources in the field are spent on developing new materials.

Nowadays, nanomaterials are found in a wide range of consumer products, and the market is expected to increase. Meantime, our knowledge of risk perception of nanomaterials is limited. A rough estimation about resources spent on research on nanomaterials and nanotechnology today, gives a distribution of 10% regarding safety issues of new nanomaterials, and 90% on innovation and development.

The participating teachers also attended a lecture by Sumitta Bhattacharyya, who presented the different aspects of making a new drug. As part of her lecture, she emphasized the long process from investigating molecules to the final drug. In addition to researchers from science and technology, we also had an invited lecture by Mats Lindahl, a science education researcher from Linneaus University. His lecture focused on teaching models and examples regarding SSIs.

Both the in-service and pre-service teachers joining the project appreciated the opportunities to meet and discuss science education from the different perspectives brought in by different researchers.

The lectures were examples of how to recognize responsible research and investigation and how scientists regard these areas. The evaluation from the teacher workshops shows that the lectures delivered by different researchers gave the teachers knowledge and perspectives they could use in their own lessons. Several of the participants in the workshops chose to work with issues connected to nanotechnology during their own PARRISE projects.
Swedish national in-service teacher professional development in SSIBL

by Katarina Ottander & Christina Ottander
Umeå University, Sweden

Umeå University got a request from the Swedish National Agency of Education (SNAE) to develop an in-service Teacher Professional Development (TPD) program about the Socio-Scientific Inquiry-Based Learning (SSIBL) pedagogical framework, providing the possibility to reach all Swedish in-service science teachers. Our experience from the first round of the in-service TPD in SSIBL gave important input in the development of the SSIBL module. The module is now available online on the Swedish National Agency of Education learning platform for collaborative collegial learning (https://larportalen.skolverket.se/#/modul/c-natur/Gymnasieskola/004-SNI).

During the 2016-2017 school year, we supervised one in-service TPD group of nine teachers, who adopted the SSIBL module. The in-service TPD module consists of eight sections. Each section has a specific theme focusing on elements of the SSIBL framework (Table 1).

As indicated in Figure 1, each section consists of four different parts (A, B, C and D). In part A the teachers read research-based texts and reflect individually over them. Part B consists of two components, collegial discussion and collegial planning of SSIBL-activities. The teachers meet and discuss the texts and their personal reflections, and move on to collegial planning of an activity based on the specific theme. In part C the teachers try the activity in the classroom and reflect individually about the activity. Part D consists of a collegial discussion and reflection about the activities performed.

Table 1. The eight sections included in the in-service TPD of the SSIBL module

| Section 1 | Introduction to SSIBL education |
| Section 2 | Communication, argumentation and action |
| Section 3 | Critical thinking |
| Section 4 | Scientific knowledge in SSIBL education |
| Section 5 | Conflicts of interests and action competence |
| Section 6 | Cultural and historical perspectives in SSIBL education |
| Section 7 | Students’ reports and assessment |
| Section 8 | Reflection and analysis |

The group we work with consists of nine teachers in integrated science, biology and chemistry; it has 90-minute meetings every third week. As of June 2017, the TPD was still continuing and the evaluation had not been concluded. However, our experience indicates that the teachers appreciate the collaborative structure, which allows them to meet and discuss research-based literature, design, and implement SSIBL activities in their classroom, and finally reflect on their experience.

We believe that the implementation of the SSIBL activities in the teachers’ classroom is of big importance for the TPD module. The sharing, comparison and evaluation of the SSIBL activities, which have been implemented in different classrooms, create a good professional development context for the teachers. For instance, in one of the recent meetings we discussed assessment. The teachers brought different student assignments which were discussed in small groups (Figure 2). The assessment of SSIBL activities are a challenging task that we need to revisit.

Figure 1. All eight sections consist of four different parts (A, B, C and D). In each section teachers act as learners, designers and reflective practitioners.

Figure 2. Tomas, one of the teachers, explains how he interprets his student’s work.
PARRISE in Stockholm
by Shu-Nu Chang Rundgren & Carl-Johan Rundgren
Stockholm University, Sweden

PARRISE has been introduced in pre-service primary science teachers' education at Stockholm University (SU) from 2015 to 2016 with two rounds (three cohorts) of teacher professional development courses, focusing on the socioscientific inquiry based learning (SSIBL) framework.

In addition to the introduction of the SSIBL framework focusing on Responsible Research and Innovation (RRI), Citizenship Education (CE), Inquiry Based Science Education (IBSE) and socioscientific issues (SSI), our aim was to present SSIBL as a concrete model for teaching and learning. A 3-step model (Figure 1) was used in our SSIBL course, initially developed by us in the context of the PROFILES European FP7 project (2010-2014).

Table 1. The participants of the SSIBL TPD courses at the SU

<table>
<thead>
<tr>
<th>TPD courses</th>
<th>Terms</th>
<th>Activities</th>
<th># of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>First round</td>
<td>Autumn 2015</td>
<td>10 hours of face-to-face lectures/activities during three days</td>
<td>28</td>
</tr>
<tr>
<td>Second round (Cohort 1)</td>
<td>Spring 2016</td>
<td>10 hours of distance lectures during three days</td>
<td>24</td>
</tr>
<tr>
<td>Second round (Cohort 2)</td>
<td>Autumn 2016</td>
<td>6 hours face-to-face lectures/activities during one day</td>
<td>24</td>
</tr>
</tbody>
</table>

Figure 1. The 3-step model for SSIBL teaching and learning

After the introduction of the 3-step model, we also used the ‘Post it!’ activity to let the participating pre-service teachers experience the 3-step model (Figure 2). This activity was followed up by group discussions, in the context of teachers’ development of their own SSIBL teaching and learning modules.

Seventy-six pre-service science teachers participated in our TPD (Figure 3) and provided feedback using a Likert scale questionnaire. The details of their participation is shown in Table 1. The teachers’ feedback was positive with an average score of 4.3 out of 6. A pre-post evaluation of the participating pre-service teachers' confidence on, and need for further education in the areas of SSI, IBSE and SSIBL teaching, indicated that the teachers had higher confidence on SSI, IBSE and SSIBL teaching, but they still needed more professional development on teaching with these ideas. Our experiences from the SSIBL course revealed the importance of introducing SSIBL to school teachers at both the pre- and in-service level. Our concluding remark is that time and space for SSIBL teaching and learning in schools and teacher education programs are both necessary for the ultimate goal of responsible citizenship education.
Mapping agro-ecological controversies: a SSIBL activity

by Lucas Nédélec & Manuel Bachtold
University of Montpellier, France

Last April, a group of 15 trainee teachers practiced the cartography of controversy at the faculty of education in Montpellier (France). This tool was presented by the teachers’ trainer as a pedagogical method made for exploring and representing a socio-scientific controversy. Based on the Actor-Network Theory developed by the French sociologist Bruno Latour, the main idea of that type of cartography is to gather, on one unique map, all the actants” (humans and non-human actors from political, economical, ecological, scientific spheres) involved in the issues of the controversy. Other elements can be represented on the cartography to reach a higher level of complexity: vectors representing the interactions between the actants, territories of the controversy, time scale, etc.

These teachers were pre-service biology teachers. They mapped socio-scientific controversies linked with one chapter of their curriculum called “Feeding humanity”. One group chose to work on the “seed war” (the question of who owns the seed varieties used in agriculture) (Figure 1). The second one chose to work on the problem of the compatibility between the development of fast food restaurants and the sustainability of agriculture (Figure 2).

Their cartographies were created during two 3-hour sessions. The post-its represent the actants identified by the trainee-teachers. These post-its can be removed, or others can be added, during the process of exploration of the controversy. Indeed, the cartography is conceived as an evolving material. During the TPD, the cartography method is focused on the importance of the doing and not on the result. Mapping a controversy is a pathway in the inquiry, rather than a final artifact production.

Introducing the SSIBL machine

by Sanne Dekker & Jan van Baren-Nawrocka
Radboud University, The Netherlands

In the PARRISE project, the Science Education Hub Radboud University (The Netherlands) has developed a useful tool for teachers. This tool, shown in Figure 1, is called the SSIBL machine and helps teachers to develop and identify a suitable SSIBL project. The SSIBL machine includes all criteria for a good SSIBL scenario, such as, for instance, ‘Is it controversial and open ended?’ and ‘Is it researchable by students?’ Teachers can run their idea for a project ‘through’ the machine. When all questions in the machine are answered with yes, their idea fits all SSIBL criteria. If one of the questions is answered negatively, it is a sign that their idea needs to be adapted. In our projects, we have found out that teachers found this tool attractive and very helpful in the stage of developing a SSIBL project. It can be used in both primary and secondary education. If you are interested in finding out more about this tool, please contact us at infowkru@ru.nl.
How can expert knowledge be integrated in a SSIBL TPD course? An example from Vienna

by Franz Radits, Elisabeth Inschlag, & Christine Heidinger
University of Vienna, Austria

In the second round of our PARRISE teacher professional development (TPD) course on “Conflicts over use at rivers near Vienna” at the Pedagogical University of Lower Austria in Baden we organized an expert lecture so that the pre-service teachers (PSTs) in our course learn about river conservation and negotiations concerning conflicts of use of rivers in Austria and from all over the world from an expert in the field. In this contribution to the newsletter we would like to point out our rationale for inviting an expert to our SSIBL-TPD course and show how we staged this lecture.

Why should you invite an expert to a SSIBL-TPD course?
Our TPD course on “Conflicts over use at rivers near Vienna” orients itself on pedagogical goals derived from an education for democracy: Students as laypersons should learn how to expand their critical capability towards experts’ scientific knowledge in order to strengthen their decision-making capability in the course of socio-scientific controversies (“Entscheidungsfähige Laien”, Fischer 2005; Radits 2012). This educational goal is based on the assumption that a democratic society needs citizens who are able to discern scientific claims from doctrines, who know how scientific claims are produced and who also know about the limits of the scientific approach to interpret the world (Driver et al., 1996). It is also based on the knowledge that many societal decisions are made with recourse to scientific expertise. Expert judgement is per se in some parts a technocratic tyranny. But during a societal negotiation process between citizens, stakeholders, legal authorities, etc. scientific expertise is integrated into democratic decision-making.

The goal of “entscheidungsfähige Laien” calls for a specific design of the learning environments for students in class as well as for PSTs in a TPD course. In our TPD course we, therefore, work on teachers’ competence to enter into a discourse with experts regarding a complex socio-scientific issue. We piloted two different learning environments:

1. In round 2 (summer semester 2017) we invited Willi Vogel (Head of the water department of the Austrian Environmental Agency), an expert in the field of “conflicts over the use of rivers”, to give a lecture in the 2nd unit of our TPD course and discuss open questions with our PSTs. Willi Vogel is an expert regarding the scientific matter (limnologic, hydro biological and hydro chemical methods and findings) and the environmental policy.

   How to set the stage for an expert lecture
   1. Invitation and instructions to the expert Willi Vogel, head of the surface water department of the Austrian Environmental Agency was invited to our course. The Austrian Environmental Agency is Austria’s largest organisation of experts on all environmental issues and is in charge of the environmental control of all surface water, the groundwater as well as the drinking water in Austria, as well as the related national and international agreements and guidelines.

   The expert was asked to talk about specific problem areas around rivers from the perspective of environmental ecology and to arrange his talk in thematic blocks. He should describe how the quality control of waters/ rivers is carried out and he should also tell about past national and international negotiation processes around conflicts over use at rivers. He also was requested to inform the PSTs about national and international regulations and guidelines. After each thematic block the PSTs had the possibility to pose clarifying questions.

2. Instructions to the PSTs The PSTs were informed how the expert was instructed and also the rationale of setting the stage of an expert lecture in an educational setting was presented to them. The PSTs were requested to take an analytical stance towards the talk. They should listen to the talk through two different lenses: On the one hand, they should focus on the content knowledge and on the nature of scientific aspects of the talk (“How does the expert generate his expertise?”). On the other hand, they should focus on the educational value of the talk regarding their professional development (“How can an expert lecture be staged so that it becomes a meaningful learning experience?”).

Overview of the content of the talk
Willi Vogel first talked about the meaning of water in general. Afterwards he pointed out specific fields of tension around waters (rivers, lakes): habitat for animals and plants vs. recreation area for humans, water for the industry vs. water for the agriculture, drinking water vs. water as waste storage of the industry, energy production, etc. All these conflicts are carried out very emotionally, even warlike in some cases. He gave some examples of such conflicts: One example regarding the corporate town Gleisdorf in Styria (Austria) and a conflict between Kazakhstan and Uzbekistan regarding the Aral Sea. This led the expert to pointing out the current legal regulations regarding water management: international law, conventions and guidelines. He also introduced the PSTs to political instruments which help to settle conflicts. In the next part of his talk Willi Vogel stressed the importance of good scientific data provided by the scientists in an open conflict. Good data create trust and are crucial to find the right solutions to problems. He gave some examples where decisions were made based on poor data and how this led to misjudgements which had detrimental effects for the environment. In the last thematic block the expert introduced the PSTs to the Water Framework Directive of the Danube region and the legal basis of the Austrian Water Management.

Figure 1. Expert lecture by Willi Vogel
3. Questions during & discussion after the talk

After each thematic block, the PSTs got the chance to collect open questions which needed to be clarified (so called “murmur groups”) in small groups. Afterwards, the PSTs posed their questions and the expert commented on them. After the talk, the PSTs got the chance to enter in a discussion with the expert. Besides content-related questions, they were invited to comment on the issues the expert raised in his talk in order to change the monologue of the expert into a multi-perspective dialogue.

Reflection on the expert lecture

Following the expert lecture, we asked the PSTs to write a short reflection on the expert lecture. The guiding question was: “How did you enjoy the expert lecture? What was of special significance for you?” In their reflections, the PSTs point out many advantages of an expert lecture like giving a vivid impression of the work in this field, arousing interest for the topic, giving concrete and authentic examples and providing valuable background information.

Examples of PSTs’ questions during the discussion with the expert

- In which ways is public participation possible in these conflicts?
- What happens if changes are made to waters in one country which affect waters in another country?
- If one wants to compare the water quality across national borders, the guidelines regarding data collection and interpretation have to be the same. Are there binding international guidelines for this?
- Where can I get as a layperson measurement results on the water quality of a specific river or lake in Austria?

Excerpts of the PSTs’ written reflection after the event

“The talk was informative and exciting.”

“It was possible to ask questions and the questions were answered in detail.”

“I gained another perspective on the topic. Especially the international perspective was new and exciting for me.”

“I wish he had presented more examples.”

“The topic became comprehensible for me because of the talk.”

“I appreciated his personal experiences in the field which allowed him to give good examples which helped to understand the theoretical contents.”

“I got a lot of background information on the topic. I also know now where I can get this information myself.”

“The expert gave a good overview over water problems – nationally and global.”

RRI-related events

RRI Festival: A public event about RRI in relation to science education at Cyprus

by Eleni Kyza & Yiannis Georgiou

Cyprus University of Technology, Cyprus

The European RRI projects Engage (www.engagingscience.eu, University of Nicosia), PARRISE (www.parrise.eu, Cyprus University of Technology), and Ark of Inquiry (www.arkofinquiry.eu, University of Cyprus) co-organized a public event about the integration of Responsible Research and Innovation (RRI) in K-12 science education in Cyprus. The joint event took place on Saturday, March 11th, 2017, from 9:00-13:00 at the University of Nicosia.

The goal of the event was to promote the discussion on how students’ everyday life can be related to science education, how students’ interest in learning science can be enhanced, and to highlight the social aspects of science education.

The event started with a presentation by the Inspector of Primary Science Education in Cyprus, Dr. Marios Charalampous, regarding the Curriculum Reform efforts for primary science education in Cyprus. The coordinators of the European programs Engage, PARRISE, and Ark of Inquiry presented each project and their efforts for integrating RRI in K-12 science education in Cyprus.

The final part of the event consisted of presentations delivered by science teachers who participated in the three RRI projects; these presentations focused on the teachers’ experiences on the development and implementation of RRI-based modules in their science classrooms. The event concluded with a public discussion allowing the audience to interact with the local RRI project coordinators, as well as with the science teachers who had presented their work.

Dr. Eleni Kyza presents the PARRISE project and its philosophy

PARRISE teachers present their SSIBL-based experiences
PARRISE Cyprus 2016-17 national conference: RRI in inquiry-based science education—The role of education in promoting students’ active citizenship

by Eleni Kyza, Andreas Hadjichambis, Yiannis Georgiou & Andria Agesilaou

Cyprus University of Technology, Cyprus

The 2nd round of the PARRISE Cyprus TPD program concluded with a national, public conference, entitled “Responsible Research and Innovation in inquiry-based science learning: The role of education for promoting students’ active citizenship”. The conference took place at the Cyprus University of Technology on May 6th, 2017, from 8:30-13:30. The aim of the conference was to give the opportunity to the different science education stakeholders in Cyprus to learn about the PARRISE project and its philosophy, focusing on the PARRISE Cyprus teacher network activities in 2016-2017, and participate in a public discussion about science education in Cyprus.

More than 100 stakeholders responded positively to our invitation and attended the 2nd national PARRISE conference at Cyprus. Participants included policy-makers, academics, school administrators, science education teachers, parents and students.

The conference started with welcoming addresses from the Rector of the Cyprus University of Technology, Professor Andreas Anayiotos, and the Chair of the Department of Communication & Internet Studies, Associate Professor Nikos Tsapatsoulis. The local coordinator of the PARRISE Cyprus project, Associate Professor Eleni Kyza, gave an introductory speech presenting the PARRISE Cyprus project. During her presentation, Dr. Kyza highlighted the main actions which were realized during the PARRISE 2016-17 TPD courses, focusing on:

♦ Promoting Responsible Research & Innovation (RRI) through the Socio-Scientific Inquiry-Based Learning (SSIBL) approach
♦ Science teachers’ professional development for promoting teachers’ understanding of the SSIBL approach
♦ The design and implementation of innovative learning modules integrating the SSIBL approach for the promotion of students’ active citizenship and RRI attitudes.

A highlight of the program was the presentation of the SSIBL modules teachers had co-designed and implemented. In addition, students from primary and secondary education schools, who participated in the PARRISE implementations, shared their impressions for the PARRISE SSIBL modules.

During the event, seven posters, prepared by the participating students and teachers, were posted outside the auditorium allowing attendees to learn more about the classroom implementations and giving the opportunity to PARRISE teachers and students to present their work to everyone during the breaks.

The last part of the event consisted of a roundtable discussion, titled “The role of education in the context of Responsible Research and Innovation”. The roundtable discussants were the coordinators of the European programs “Ark of Inquiry” (www.arkofinquiry.eu) [Associate Professor at the University of Cyprus, Zacharias Zacharias] and Engage (www.engagingscience.eu) [Assistant Professor at the University of Nicosia, Maria Evagorou], and representatives from the Ministry of Education and Culture of Cyprus [Giorgos Yiailouridis, Inspector of Primary Education; Chrystalla Koukouma, Chemistry Education Inspector; Dr. Andreas Hadjichambis, representative of the Biology Inspector]. The discussion was coordinated by Dr. Eleni A. Kyza. The event concluded with a public discussion allowing the audience to interact with the invited speakers by asking additional questions.

Snapshots from the PARRISE Cyprus 2016-17 national conference
Democracy and tolerance in education: including moral values in all subjects

by Wiel Veugelers

University of Humanistic Studies, Utrecht, The Netherlands

Democracy and tolerance are considered as crucial moral values in the European Union. On request of the European Parliament we have studied how in all 28 EU Member States education policy and practice pay attention to teaching common values democracy and tolerance. University-based experts in all 28 EU Member States participated in the study and analysed research outcomes and policy documents about their country. In 12 countries we also did case studies in which the experts had interviews with policy-makers, NGO representatives and teachers. The report of the whole study has been published by the European Parliament and the study was presented and discussed in the European Parliament. The recommendations will be used in future policy of the European Commission and hopefully in all member states.

What are the results of this study that are relevant for our PARRISE project?

1. Gaps. There is not only a gap between policy and practice regarding teaching democracy and tolerance, there is also a gap within policy: between the general aims and concrete measures. In many countries there are intentions formulated but not translated into curriculum guidelines. This contributes to a practice that does not always give real attention to teaching common values.

2. Whole school approach. Values can be taught in value-oriented separate subjects like moral education or citizenship education, integrated in value-related subjects like biology and science, in cross-curriculum projects, in out-of-school activities, in the school culture and in the diversity between students and between teachers. All elements seem necessary and can enforce each other.

For PARRISE the integration of values in subjects is very relevant. In many countries there is some attention for this integration, but mostly not very explicit. Which values are integrated and how this has been done can be made more transparent.

3. Dialogues and controversial issues. Teaching democracy and tolerance requires a learning environment that is more reflective, dialogical and democratic than traditional teacher-directed education. This kind of teaching is sometimes mentioned in policy, however, teachers find it difficult to realize it. The conditions are not supporting this kind of teaching and learning.

Learning and inquiring using different theoretical, scientific, and political perspectives are needed to learn democracy and tolerance, in particular for developing democratic and tolerant attitudes. Teachers find this often difficult with controversial issues. Teaching democracy and tolerance would benefit when in many educational activities it is normal to learn and inquire using different perspectives. Science education, like developed in PARRISE, can contribute to this.

4. Limited interpretation of democracy and tolerance. When policy and practice pay attention to democracy and tolerance it is often in a limited and restricted sense. Democracy is considered as participation and political involvement, less as deliberation and consensus-building, and even more less as a strong and critical sense of democracy in all parts of society. Tolerance is in particular considered as interpersonal relationship, a bit on the level of different social and cultural groups, and even less as an inclusive society. Democracy and tolerance should be taught in a more elaborated way.

Education like PARRISE that address how in specific subjects teaching values is incorporated can add in a significant way to the desired whole school approach of teaching common values like democracy and tolerance.


The report can be downloaded at http://bit.ly/zpmcYha
The PARRISE project will have a strong presence at ESERA 2017 in Dublin!

The 12th Conference of the European Science Education Research Association (ESERA 2017) will take place in Dublin, Ireland between August 21-25, 2017. The conference is an important European institution, providing science educators and science education researchers with the opportunity to present their work and learn from science education efforts around Europe and the world. PARRISE will have a strong presence at this important science education conference and will be represented at the following symposium, paper and poster sessions.

SYMPOSIUM
Responsible Research and Innovation (RRI) in the science classroom: Students’ learning outcomes
Organizer: Anat Yarden, Weizmann Institute of Science, Israel
Discussant: Professor Isabel Martins, Universidade Federal do Rio de Janeiro, Brazil

♦ Students’ attitudes towards RRI as a result of a lesson developed in the IRRESISTIBLE project
Sherman Rosenfeld, Shelley Rap, Esty Zemler, Ron Blonder
Weizmann Institute of Science, Israel

♦ A SSIBL project to promote high school biology students’ learning and motivation
Cristina Días, Maria Joao Fonseca
University of Porto, Portugal

♦ High school students’ engagement in a socioscientific project: Development of identity in practice
Eran Zafarni, Anat Yarden
Weizmann Institute of Science, Israel

♦ Building students’ capacity for democratic participation and responsible innovation through science education
Eleni Kyza, Yiannis Georgiou, Andreas Hadjichambis, Andria Ageslaou
Cyprus University of Technology, Cyprus, Cyprus Ministry of Education and Culture, Cyprus

PAPERS
♦ Teachers’ design of socio-scientific inquiry-based teaching and learning sessions
Christina Ottander, Katarina Ottander
Department of Science and Mathematics Education, Umea University, Sweden

♦ A co-design approach to teachers’ professional development about responsible research and innovation
Eleni Kyza, Andreas Hadjichambis, Yiannis Georgiou, Andria Ageslaou
Cyprus University of Technology, Cyprus, Cyprus Ministry of Education and Culture, Cyprus

♦ Pre-service teachers and socio-scientific inquiry: Opportunities and challenges
Marie-Christine Knippels, Michiel van Harskamp, Roald Verhoeff, Paulien Postma
Freudenthal Institute, Utrecht University, The Netherlands

♦ Teaching science using socio-scientific inquiry-based learning: UK pre-service teachers’ perspectives
Andri Christodoulou, Ruth Amos, Marcus Grace, Ralph Levinson
University of Southampton, UK; University College London-Institute of Education, UK

♦ Science and technological innovations as drivers for educational change: Teachers’ perspectives of an inquiry-based project into the unknown
Helen Hasslöf, Mats Lundström, Jesper Sjöström
Malmö University, Sweden

♦ Relations and responsibility in pre-service science teachers’ talk about nanotech education
[The paper is part of the SIG 4 symposium “Addressing complexity in Science | Environment | Health pedagogy”]
Jesper Sjöström, Helen Hasslöf, Mats Lundström
Malmö University, Sweden

POSTERS
♦ Improving science teachers’ knowledge and awareness of socio-scientific inquiry-based learning
Rachel Cohen, Anat Yarden
Weizmann Institute of Science, Israel

♦ Primary school pre-service teachers’ confidence and need concerning socioscientific inquiry based learning
Shu-Nu Chang Rundgren, Carl-Johan Rundgren
Stockholm University, Sweden

♦ Primary teachers’ reflections-in- and on-actions concerning socioscientific inquiry based learning activities
Carl-Johan Rundgren, Shu-Nu Chang Rundgren
Stockholm University, Sweden

♦ Initial science teacher education through socio-scientific inquiry of climate issues involving communities and schools
Diana Radmann, Franz Rauch, Bernhard Schmolzer
Alpen-Adria-University Klagenfurt, Austria; University of Teacher Education Klagenfurt, Austria

♦ PARRISE Promoting Attainment of Responsible Research and Innovation in Science Education
Marie-Christine Knippels
Freudenthal Institute, Utrecht University, The Netherlands

ESERA 2017 will immediately follow the PARRISE final conference on August 20th, 2017. We hope to see you at both events!
PARRISE - Promoting Attainment of Responsible Research & Innovation in Science Education

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SEVENTH FRAMEWORK PROGRAMME
SiS-2013-2.2.1-1
Grant agreement: 612438