Chapter 13
Educational Potentialities of Student-Curated Exhibitions on Socioscientific Issues: The Students' Perspective

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Abstract The IRRESISTIBLE Project had the aim of involving teachers, students, and the public in the discussion on Responsible Research and Innovation (RRI), promoting both the construction of knowledge about cutting-edge (and controversial) research topics (socioscientific issues—SSI) and discussion about the criteria that research/innovation processes should respect to be considered as responsible. This chapter presents qualitative results on the educational potential of IRRESISTIBLE's student-curated exhibitions about SSI and their RRI dimensions. Student-curated exhibitions took place in different contexts—schools, universities, museums, and public places—and were assumed as an activism strategy through which students informed the community about the SSI they had researched, and triggered discussion about the necessary conditions to ensure RRI practices in those areas. Data were collected through interviews with participating students from 10 countries. Overall results indicate that students improved their perceptions regarding their competences in developing exhibitions as a way of creating awareness about topics relating to science, technology, and society. This activity reinforced students' perceptions that in science classes they develop socially relevant projects and learn how to influence other citizens' decisions about social issues related to science, technology, and the environment, with the aim of ensuring a more sustainable future.

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13.1 Introduction

The main goal of Project IRRESISTIBLE (FP7, Grant 612367) was to foster students' and community participation in the Responsible Research and Innovation (RRI) process (Apotheker et al., 2017; Blonder et al., 2017). Each IRRESISTIBLE partner organized a Community of Learners (CoL)—formed by students, science teachers, science educators, scientists and science museum experts—aimed at supporting students in the development of student-curated exhibitions addressing cutting-edge (and controversial) research topics (socioscientific issues—SSI) and discussing the criteria that the research and innovation processes should respect in order to be considered as responsible. Reflection on the RRI dimensions of each SSI was guided by those proposed by Sutcliffe (2011): (a) engagement—participation of civil society together with researchers and industry in the research and innovation process; (b) gender equality—equal involvement of both women and men; (c) science education—quality education capable of supporting the future needs of society; (d) ethics—the respect of fundamental rights and the highest ethical standards; (e) open access—free online access to the results of publicly funded research; (f) governance—the responsibility of policy-makers in the development of harmonious models for RRI. SSI were selected by the students, organized in groups.

The process of exhibition development was preceded by an inquiry phase where students researched both the selected SSI and the RRI dimensions of the issue. After searching for information, students were supported by the CoL in the development of the exhibition, which implied the selection and presentation of information in a way that would grab visitors' attention and trigger their reflection and discussion about the issues. With the selected information, students built different modules for the exhibition: table games, quizzes, posters, cartoons, models, multimedia presentations, experiments and demonstrations, and digital Apps (Apotheker et al., 2017). Student-curated exhibitions took place in different contexts: schools, universities, museums, and public places. The process of the exhibitions' development proposed by IRRESISTIBLE project required students to communicate and exchange their research-based knowledge with a wider audience, in close relation with their active citizenship rights and responsibilities (Reis et al., 2020). Through the exhibitions, students discussed the SSI they had investigated with the community and the necessary conditions to ensure that research and innovation in those areas was orientated by responsibility. Exhibitions were assumed to be collective actions of democratic problem solving, empowering students to be critics and producers of knowledge (Reis, 2014a, 2014b). The IRRESISTIBLE project represented a valuable context to study the necessary conditions and the educational potentialities of student-curated exhibitions about SSI (and their RRI dimensions) that students consider important and relevant for their lives and the lives of their communities.

13.2 Theoretical Framework

Through the media, citizens are frequently in contact with the controversial dimensions of cutting-edge research topics, many of them related to the possible criteria for ensuring responsible research and innovation in these areas. Many cutting-edge scientific and technological topics correspond to a 'borderline science', that is preliminary, uncertain, controversial, and under debate. The collaboration between societal actors—researchers, citizens, policy-makers, etc.—during the whole research and innovation process has been considered a way to: (a) connect both the process and its outcomes with the values, needs, and expectations of society; and (b) a more sustainable world (Owen et al., 2012). Science education has also been seen as a context to involve students and their communities in the process of RRI (Apotheker et al., 2017; Blonder et al., 2017).

One of the major aims of science education is to provide all students with the opportunities to develop the scientific knowledge, skills, and confidence necessary for active engagement and contribution to societal discussions about SSI (Osborne & Dillon, 2008; Ottander & Simon, 2021; Sadler et al., 2007). Socioscientific issues can be defined as 'hot science', focused on the symmetry between different interests or perspectives associated with controversial issues (Meyer, 2010). Science education based on SSI has the potential for promoting students' democratic participation (Ottander & Simon, 2021; Sadler et al., 2007), developing their self-perceptions as legitimate participants in problem-solving and decision-making processes regarding SSI (Sadler, 2009).

Many SSI, involve environmental and sustainability dimensions. Through a pluralistic perspective (Borg et al., 2012) and assuming environmental and sustainability problems as conflicts between people and different stakeholders, students learn to critically examine different voices, interests, and standpoints within a sustainability debate. In addition, science education based on SSI can stimulate students and teachers' involvement in activism initiatives, aiming for problem-solving through social change and socio-political actions (Bencze & Carter, 2011; Reis, 2014a, 2020). According to Hodson (2003), science education oriented toward socio-political action is a key element in solving the social and environmental problems of our world, contributing to "produce activists: people who will fight for what is right, good and just; people who will work to re-fashion society along more socially just lines; people who will work vigorously in the best interests of the biosphere" (p. 645). A way to implement such science education is through students' engagement in self-led and open-ended inquiry activities regarding real-life problems associated with SSI, and stimulating students' participation in collective democratic problem-solving actions (e.g., through the use of social networks, art initiatives, and/or exhibition curation) (Alsop & Bencze, 2014; Freire et al., 2013; García-Bermúdez et al., 2014; Kowasch et al., 2021).

The development of exhibitions based on SSI involves students in inquiry and discussion about socioscientific controversial matters, with positive outcomes in terms of: (a) learning about the contents, processes, and nature of science and technology (Kolstø, 2001); (b) understanding characteristics of borderline science (Levinson, 2006); (c) understanding the complex interactions between science, technology, society, and environment (Linhares & Reis, 2020); (d) developing cognitive, social, political, moral, and ethical competences (Kampschulte & Parchmann, 2015; Kolstø, 2001); (e) developing skills of inquiry (Sleeper & Sterling, 2004); (f) stimulating collective reflections between students and visitors, transforming both into learners (Braund & Reiss, 2004); (g) involving students in community action on SSI (Linhares & Reis, 2017; Marques & Reis, 2017); and (h) moving assessment from a product to a process (Blonder, 2018).

An SSI-based exhibition is different from other kinds of exhibitions, focusing on stimulating personal reflections and increasing public engagement with science. It results from a focus not only on the understanding of the products and processes of science, a goal of scientific literacy, but also in the complex interactions between science, technology, society, and environment, allowing citizens' engagement in informed decision-making and problem-solving processes regarding SSI (Koster, 2010; Reis et al., 2020). These exhibitions are quite challenging for their curators because they must: (1) question the social, economic, political, and ethical impacts of scientific and technological proposals in visitors' daily lives; (2) raise questions, in-depth discussion, and critical thinking instead of providing correct answers; (3) provide contextualized information (e.g., the opinions of different social stakeholders regarding those issues); (4) invite visitors to actively develop their own critical perspectives and to share them with others; and (5) challenge visitors for collective problem-solving action on those issues (Cameron, 2012; Pedretti, 2004; Yun et al., 2020).

13.3 Methodology

During the 2014/2015 and 2015/2016 school years, a total of 218 exhibitions on the RRI dimensions of SSI were developed involving a total of 7340 students. To know how students perceived this process and how it affected their competences and their science classes, a mixed approach was used, with a qualitative component (involving the development of case studies by each IRRESISTIBLE partner) and a quantitative component (with the application and statistical analysis of a pre/post questionnaire) (Reis et al., 2020). All the methodological procedures were validated by the ethical committees of the different universities involved. This chapter is centered on the qualitative component.

To understand the process of exhibition development and the impact that this process had on the participants, each partner developed (at least) two case studies, focusing on one particular exhibition. This way, from the total of 218 exhibitions developed during the IRRESISTIBLE project, 26 were selected by the partners (as illustrative examples) to be the focus of a case study. These 26 exhibitions were developed by 1357 students distributed over 59 classes from 5th to 12th grade, with the support of 55 teachers, plus 18 student teachers (Table 13.1).

Table 13.1 Study cases topics and participants

Partner	Exhibition name	Total number of teachers	Total number of students	Total number of classes	Grade
Finland	Climate change	4 (16[a])	86	4	6th
	Climate change and geo-engineering	1 (2[a])	30	4	6th
Germany 1	Plastic–Bane of the ocean	1	22	1	9th
	Human impact on the oceans	1	27	1	11th
Germany 2	Future Ocean	4	60	2	9th
Greece	Nanoscience and its applications	1	16	1	8th
	The nanotechnology of self-cleaning materials	1	21	1	10th
Israel	Perovskyte-Based Photovoltaic Cells	1	16	1	9th
	The Milk Exhibit	1	32	1	11th
Italy 1	Ecopoly	1	23	1	12th
	RRI & Energy Sources	1	136	6	9th (4), 10th and 11th
Italy 2	RRI and Solar Energy	3	73	4	8th and 11th
	RRI in an Inquiry-based approach	4	61	4	10th and 11th
Poland	Nanoworld	1	35	1	10th
	Nanoworld	1	35	1	8th
Portugal	RRI and Polar Science	1	46	2	10th
	The Irresistible from class 8D	2	21	1	8th
	RRI in the Portuguese Polar Science	1	27	1	10th
	Geo-engineering of climate	1	27	1	10th
The Netherlands	Healthy ageing starts with mama 1	2	81	3	11th

(continued)

Table 13.1 (continued)

Partner	Exhibition name	Total number of teachers	Total number of students	Total number of classes	Grade
	Healthy ageing starts with mama 2	2	18	1	11th
	Healthy ageing starts with mama 3	2	55	2	11th
Turkey	Nanotechnology applications in Health Sciences	1	20	1	5th–9th
	RRI in the Context of Climate Change	15	154	6	5th–10th
Romania	Nanomaterials and Energy	1	210	7	10th–12th
	Nanoscience - A Facilitator Background for a United Group	1	25	1	7th and 8th
Total		55 (18)	1357	59	

[a]Student teachers

To facilitate the process of case-study development, a set of guidelines was developed and shared with all partners. This guide—indicating all the procedures to be taken, and the structure/sections of the case study—was intended to guarantee that the data featured in all partners' cases would be comparable and would cover all the important aspects for the project. The guidelines included: (a) procedures regarding participants and data collection; (b) case study structure; and (c) items to be used. The case study corresponded to an exhibition on the RRI dimensions of a SSI, implemented at school, university, science center, or museum. The participants of each case study were: (a) students involved in the exhibition; (b) teacher(s) of those students; and (c) science educators, experts from museums, and scientists who supported students during the exhibition's development.

Data collection took place at the end of the entire process and had to comprise: (1) an interview with the teacher(s) or an open questionnaire, focusing on their difficulties with the construction and development of exhibitions, their professional learning, their thoughts on the impact on students' learning, and their overall evaluation of the process of construction and development of the exhibition; (2) a focus group interview with a group of students who planned and developed the exhibition, focusing on the description and evaluation of the entire process, the difficulties experienced and their learning achievements; and (3) an interview with the scientists and the experts from the science center/museums, or an open questionnaire, focusing on their perspectives regarding the process of construction and development of the exhibition, and their overall evaluation of the process. The individual and focus group interviews and analysis followed a qualitative approach, with the integral transcript being submitted to content analysis. For this paper, only the data regarding the exhibitions' characterization (e.g., title, locale where they took place, authors, developed objects) and the students' perceptions about the entire process are presented.

13.4 Results

A total of 26 case studies were developed by IRRESISTIBLE partners with the aim of presenting how the process of developing the scientific interactive exhibitions was experienced by the participants. Guidelines for the case studies allowed the collection of common information regarding each exhibition, focusing on the development process and students' *difficulties* and the *learning achievements* during the process.

13.4.1 Previous Activities and Tasks

The entire development process began with several activities—organized by teachers together with other CoL members—designed to engage students in a specific SSI and its RRI dimensions. These activities were all conducted with a focus on generating content and input for the exhibitions in both areas. As we can see in Table 13.2, lectures/talks from experts (22), brainstorming/debates (14), hands-on activities/experiments (14), and visits to university labs, museums, and science centers (13) were the most frequently implemented activities.

There was a consensus among students that the activities leading to the exhibition design were crucial for learning, allowing them to develop ideas about the approach to be used when planning and constructing their exhibits.

13.4.2 Planning and Construction Phase

The exhibitions had to be planned with the aim of highlighting scientific cutting-edge topics and the RRI dimensions of the SSI, taking into account that they must trigger visitors' attention and reflection. Exhibitions were planned and constructed by the school students. The Finnish cases were the only exception. In the first case study, Finnish student teachers designed and created almost the entire exhibition. However, students' ideas and some objects built by them were integrated into the exhibition, such as videos related to climate change and CO_2 equivalents. In the second case study, adding to materials developed by students, the Finnish student teachers designed and created additional experiments to be incorporated into the final exhibition.

In all cases the process of planning and construction was performed in groups. In most of the exhibitions, the process was initiated by a group brainstorming or

Table 13.2: Types of activities preceding the exhibitions

Type of activity		Number of activities preceding the exhibitions
Lecture/Talks	Scientific topic	9
	RRI	6
	Exhibitions	7
Visits	University labs and Research centers	8
	Museums and Science centers	5
Student Presentations about the topics		9
Brainstorming/Debates		14
Games/Role play		5
Hands on activities/Experiments		14
Watch videos/Documentaries		4
Field trips		2
Search for information	In Internet	1
	Critical study of newspaper articles	1
	Scientific papers analysis	1

debating the topics to be addressed. Students mentioned that their choice resulted from the topics that they had researched during previous tasks or the topic they considered as being more relevant to society.

The selection of topics to include in the exhibition was followed by the organization of the students into small groups and a topic assigned to each group. Each group was then responsible for the design and construction of the objects related to their topic.

Both teachers and students used different tools to manage the entire process of exhibition development. Some of the resources used included: a workflow with tasks and a time frame to help students keep track of their assignments (Germany); expert panels (Germany); mind maps (Germany); Edmodo (Greece); WordPress (Portugal); Moodle (Portugal); and Facebook groups (Greece, Portugal, and Poland). The tools were used for: (a) communication (intra- and inter-groups and between the groups and the teacher); (b) giving feedback from the teacher, scientists, and experts who were supporting the process; and (c) sharing the work done by different groups, since some of the tasks were developed outside the classroom.

Student groups were responsible for producing one or more objects for the exhibition about the selected topic, focusing mainly on the researched SSI and its RRI dimensions. Each group designed a plan for the construction of an object—type, size, exhibition mode, materials, and a general outline of the object's content. The plans designed by each group were reviewed by the other groups (Germany), by the teacher, and in some cases also by expert members from the university or science centers (i.e., Finland, Portugal, Greece, Israel, Italy, The Netherlands, Romania, and Turkey). Students were free to choose the type of object they wanted to construct, considering the interactive character that the exhibition should have and using accessible materials that could be easily bought or recycled. Concerning the interactive scenarios selected and the type of objects built by students, in Table 13.3 we can see that games, models, experiments/demonstrations, and posters were the types of objects most frequently selected for the exhibitions.

The option for games (physical or digital) was chosen by many students involved in the development of interactive exhibitions. Students believed that games could be a very powerful strategy for stimulating visitors' participation, prompting them to interact and creating an atmosphere where the discussion and reflection about important issues can be accomplished in a more playful way.

The development of models was also one of the most frequently chosen type of object produced for the exhibitions. Students and teachers made this choice especially when their exhibits involved physical and biochemical concepts and phenomena. This strategy supported an interactive approach by allowing visitors to understand more abstract concepts.

Experiments/demonstrations were also a frequent choice by students as an object capable of stimulating interaction between visitors and the exhibition. The development of a poster was a scenario chosen several times. Students believed this type of object could give information to the visitors, but could also engage them in the topics when interactivity is promoted.

Other objects presented in the IRRESISTIBLE exhibitions were multimedia presentations, books, and cartoons (printed or digital). These objects were chosen by the students as a way to engage visitors with the SSI addressed by students. A digital application for mobile phone was another object developed by Turkish students to include in the Nanotechnology applications in the Health Sciences exhibition.

Table 13.3: Types of objects within the 26 exhibitions

Type of object		Number of exhibitions with this type of object (from a total of 26)	Total number of objects developed by students
Game	Physical (e.g., cardboard, soccer table)	9	70
	Digital (e.g., quizzes)	3	4
Models		15	54
Physical poster		11	29
Experiments/Demonstrations		12	23
Multimedia presentations (e.g., videos, audio)		8	11
Cartoons (digital or printed)		2	15
Digital app		1	1

The role of teachers during the process of planning and constructing exhibitions required them to provide guidance and support to their students. The Finnish exhibition was the only exception, since the process of planning and construction was also developed by student teachers as already mentioned. In all of the other cases, teachers oversaw students' work and gave them advice concerning both content and process.

13.4.3 *Display of Exhibits*

Regarding the place where the exhibitions were displayed, schools were the favorite location: 21 of the 26 developed exhibits were displayed in that context. However, several others took place in museums, universities, and at other different events (Table 13.4).

In the exhibitions displayed at schools, students guided visitors through the several objects presented. These exhibitions had school students and teachers as the target audience, as well as the school community when the exhibitions were open (e.g., Portugal, Poland, and Turkey). Exhibitions that were open to the public allowed a broader contact with general citizens with the RRI dimensions of the SSI addressed.

The Portuguese Geo-engineering exhibition was a very successful case reaching approximately 24,000 visitors. Both media and government officials were present and visited the exhibition, allowing students to disseminate their work.

The amount of time that the exhibitions were on display varied a lot. Some were exposed for only one day (Israel, Portugal, Italy (1). Others for one week (Germany, Portugal, Italy (2), two weeks (Poland), or even more than a month (The Netherlands).

Table 13.4: Number of exhibitions held in different locations

Place of display of the exhibitions		Number of exhibitions
School		21
Museum		6
University		2
Events	Science fair	1
	Conference	1
	Thematic day	1
	Science day	3
Web		1

13.4.4 Difficulties During the Exhibition Development Process

Difficulties experienced by students during the exhibition development process (and mentioned in the case studies) can be organized in 10 categories (Table 13.5). Many of these difficulties are frequently associated with the development of exhibitions about SSI (Cameron, 2012; Yun et al., 2020).

The organization and/or management of group work in order to develop the exhibitions represented the biggest challenge for students.

> In such an activity, group commitment is important, so the roles must be organized. Each member needs to know exactly what to do, what to say and when. So, the success of such an activity depends on teamwork. (Student, Israel)

In some cases, due to the time-demanding task of constructing the exhibition, groups developed their objects at home, presenting a challenge when managing students' contributions to the group.

> We had difficulty to gather in extracurricular hours and some of us didn't bring all the material we needed each time. So, we were late and we only completed the exhibit a few days before the public opening. (Student, Greece)

Another challenge faced by the students during the process of exhibition development was the novelty of the scientific topic, both the science and the RRI dimensions of the SSI. Although some case studies found that students faced the challenge of understanding an unfamiliar scientific topic, others specifically mentioned that the difficulty was mainly in selecting and organizing information that was truly necessary for the exhibition development.

> For me the most difficult part was to distinguish what information to include in the poster and what not to, but also to make it simpler for the visitors to be able to understand it when they interact with the exhibit. (Student, Greece)

Table 13.5: Difficulties for students in the exhibition development process ($N = 26$)

Difficulties mentioned by students	Number of case studies mentioning the difficulty
Group work organization/management	18
Novelty of scientific topic and RRI	17
Planning the exhibition	17
Time management	16
Construction of the exhibition	12
Resources and materials	5
Motivation	5
Presenting the exhibition	2

One of the innovative aspects of the IRRESISTIBLE project consisted of having the students assuming the central role in the process of exhibition planning. Students had to plan an interactive exhibition with the goal of fostering public awareness about both the RRI dimensions and the selected SSI.

> Well, I found [it] a bit difficult to achieve the interactive part of the exhibition. Since it had to be interactive, we had to get something, a game to interact with people, instead of just showing our work. (Student, Portugal)

Other students failed to predict the requirements needed to develop the exhibition either inside or outside school.

> I thought the most difficult part was to plan everything well, trying to get ... well, a support for our exhibition, because we were there, outdoors, without the possibility of having audio support, or video. (Student, Portugal)

Time management to prepare the exhibitions represented another main challenge for students. The development of the exhibition was time-consuming and difficult to combine with other school activities happening at the same time (mostly tests and exams), which raised students' levels of anxiety. Another aspect highlighted as a difficulty by students was constructing the exhibition, as technical difficulties posed challenges.

13.4.5 Learning Achievements

During the process of exhibition development, students were confronted with tasks and situations that led to learning. According to our analysis, students' learning achievements could be organized into nine categories (Table 13.6).

In almost all of the case studies, students mentioned the fact that they learned about the SSI addressed by the exhibition and its RRI dimensions. The degree of

Table 13.6: Students' learning achievements during the process of exhibition development

Students' learning achievements	Number of case studies
SSI and RRI	25
Project management and group work	12
Development of interactive exhibits	7
Selection and organization of relevant information	7
Communication skills	6
Practical/experimental work skills	6
Self-confidence on abilities and skills	4
Empowerment/sense of usefulness to others' education	3
Nature of Science	3

learning was dependent upon several factors, one of which was the topic itself—and the complexity of concepts associated with it.

> I learned a lot and I think it will be useful for me in the near future. Also about RRI, I learned its fundamental points and I think that many people should know about it. (Student, Italy1)

All students developed the project working in groups. For some, that work lasted several weeks. It comes with no surprise that the second most mentioned achievement was the improvement of group work and project management skills.

> Sharing tasks... That was a major difficulty, by the way! It was hard but, at the same time, it was a learning experience. (Student, Portugal)

For some students the process of exhibition development lasted several weeks and was understood as project work. This could be the reason why some students highlighted that this experience led them to develop project management skills, which are very important when dealing with a major task such as the development of an exhibition.

> We've learned how to manage a project. (Student, Poland)

Some students pointed out that they had learned how to develop interactive exhibits—a new experience for most of them. Some students' answers revealed their understanding about the importance of developing an interactive exhibition to engage the audience, which can lead to more effective education of visitors.

> I think we are all to be congratulated because we created very interactive objects and this is not very normal! Normally we [are] used to prepare posters that are very boring! This time we managed to do more interactive things and I think that's very important to attract visitors' attention and to promote learning. (Student, Portugal)

By creating an exhibition aimed at sharing information with an audience, students faced the task—for some a challenging one—of having to communicate with visitors, either by explaining their work or by answering unexpected questions. Some students valued this opportunity for the development of their communication skills.

> Above all we have learned how to present things in front of other people and this is not a trivial matter. We had to develop some skills... this was encouraging… it was the first time we made something like that. (Student, Italy2)

Another achievement was the development of practical/experimental skills. Some students valued developing these more practical activities related to the construction of the exhibition object.

> Mainly technical issues concerning the treatment of polystyrene. (Student, Poland)

In four case studies, students developed confidence in their skills. This aspect is very important, given the fact that the tasks of having to improve their knowledge about SSI and RRI, and to plan and develop an interactive exhibition for a large audience on those topics, were quite challenging.

> We never thought that we would be able to create an object like that—at least I was quite proud of what we have created! (Student, Portugal)

Aligned with the goal of developing an interactive exhibition, came the sense of usefulness that some students experienced and mentioned in their interviews. For them, the experience of developing something for others to learn was very rewarding. Students learned that they can develop actions—the exhibition—with the purpose of educating others. They felt empowered.

> We developed our project for all individuals and our society. We explained it for the visitors. We think that these will be transferred from generation to generation and be effective for many people. (Student, Turkey)

Finally, related to the specificities of the SSI addressed, some students mentioned that they learned about the Nature of Science.

> We've learned how the system of scientific research works, what scientists really do, because I think that before we had not been aware of that. (Student, Poland)

13.5 Conclusion

After the analysis of the 26 case studies developed by the IRRESISTIBLE partners, the first conclusion we can draw is that students appreciated and valued the experience of curating an exhibition about the RRI dimensions of a SSI, despite considering it quite demanding in terms of time and group management, and the required competences. These students enjoyed developing an interactive exhibition in the context of science classes, being creative, and playing a central and active role throughout the process (e.g., being allowed to choose the SSI to address, the narrative, and the objects for the exhibition). They felt more motivated to learn, and more engaged in the process, because *learning* was recognized as *socially relevant.* The opportunity to interact with visitors and to observe first-hand the impact of their work was also appreciated by most students.

The task of developing an interactive exhibition focused on the RRI dimensions of an SSI was a novelty for the students. For some, this task was even a four-in-one novelty, requiring them: (a) to develop an exhibition; (b) that had to be interactive, stimulating reflection, and interaction; (c) focused on an SSI; and (d) where RRI dimensions had to be integrated and discussed. Students are not used to being on the stage and playing a central role in their classes. It is perhaps safer and more convenient for them to delegate responsibility to the teacher for their learning. Consequently, students faced some difficulties, namely working in groups, planning an exhibition with such characteristics, and managing all the necessary sub-tasks. However, during the process, their initial anxiety—related to the fear of not being able to accomplish this new challenge—was replaced by self-confidence as they managed to overcome the difficulties.

While teachers' support was crucial in helping students overcome difficulties related to group and project management, the support of the other CoL members was quite important in: (a) advising students about how to develop an exhibition centered on SSI (e.g., science museums experts) and RRI (e.g., scientists); and (b) providing students with the necessary scientific and technological background about those issues (e.g., scientists).

The analysis of the case studies emphasized that the exhibitions' development process supported students' learning: (a) of knowledge on cutting-edge (and controversial) research topics (SSI); (b) the criteria these research/innovation processes should respect in order to be considered as responsible; (c) the complex net of interactions between science, technology, society, and environment; (d) on how to develop an exhibition about SSI and RRI capable of grabbing visitors' attention and triggering reflection on those issues; (e) of social skills, associated with group work and project management skills—planning, (re)planning, distributing tasks, respect deadlines, account for others' opinions, and achieve a consensus, among others; (f) of communication skills—both connected with group work and the capacity to communicate ideas to a big audience in a motivating way; (g) of argumentation skills both with classmates and visitors; and (h) of critical thinking skills when faced with the need to understand a complex topic—reading different information sources, selecting relevant information, and organizing that information into a coherent whole that is usable for developing their exhibition.

For some of the partners, a significant development of the IRRESISTIBLE exhibitions was allowing students to understand that they *can* and *must* have an important role in society. They are citizens—not just *future citizens*—and that means that they can act *now* (not just in the future), trying to understand some of our societal problems, and helping to solve them. The development of the IRRESISTIBLE exhibitions, understood under this perspective, is a more meaningful process for students: they feel useful; they feel that what they learn is useful; and they see school and science education as useful too. Therefore, the development of this kind of exhibition promotes students' active citizenship skills.

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