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Going virtual: Finding new ways to engage higher education students in a participatory project about science

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Introduction

The COVID-19 pandemic threw into disarray almost all spheres of human activity. Research is no exception. When labs and research centres closed, scientists were told to stay at home, scientific events were cancelled or postponed to an uncertain date, most scientific projects had to be put on hold or modified substantially.

This chapter concerns the adjustments and adaptations that had to be made in one such project, PERSIST_EU, an international project aimed at bringing together European university students through the organisation of participatory events in five cities. The participation of students should provide needed insights about knowledge, perceptions and opinion on science, and how these can be changed by engaging and discussing controversial scientific topics.

According to the Flash Eurobarometer (n. 239, 2008), European youth believe that interest in science is essential for future prosperity and scientific research should serve chiefly the development of knowledge. Young adults are actively involved with content created by scientists when it is presented in the new model that involves two-way communication (Bauer et al., 2007) and sees the participants as stakeholders of science, encouraging active engagement (Hargittai et al., 2018). They are more likely to participate in scientific activities that have an interdisciplinary aim and engage with topics that have become popular in the 21st century, such as vaccines and climate change (Bauer, 2011).

This chapter describes how the project methodology was modified due to the containment strategy against contagion in Portugal and Germany. As face-to-face engagement was made impossible, the chapter focuses on the design and implementation of alternative approaches for recruiting and involving participants, and the adaptation of a live event to an online platform.

Since students have high levels of computer literacy (Salmon, 2003) and online research methodologies, such as survey and focus group, have been proliferating since the early 2000s (Turney and Pocknee, 2005), the project was able to develop a suitable new strategy. Furthermore, as Hargittai et al. (2018) affirmed, the interaction afforded by online platforms is particularly important for young audiences.

The project

PERSIST_EU is an international project funded by the Erasmus+ Programme of the European Union that seeks to draw needed insights on European university students' knowledge, beliefs and perceptions on controversial scientific issues. It aims to understand how EU students' opinions are formed and how to improve scientific knowledge in order to allow them to have an active role in public health and environmental campaigns or programs. The activities are focused on four topics: climate change (CC); complementary and alternative medicines (CAM); Genetically Modified Organisms (GMO); and vaccines (VAX). PERSIST_EU's purpose is to analyse possible changes in opinions on these topics as students take part in participatory events, called Science Camps (SC).

This project will develop two main outputs, an ICT platform for the assessment of science knowledge, perceptions and beliefs before and after the SC and an e-book concerning indicators of social appropriation of science, available on the project's [webpage](#). The methodology implemented by Persist_EU, in particular the ICT tool, will be made available to European high schools and universities.

The project is coordinated by the University of Valencia, in Spain. The consortium is formed by six partners, including the Institute of Social Sciences of the University of Lisbon (Portugal), Karlsruhe Institute of Technology (KIT, Germany), Trnava University (Slovakia), Observa Science in Society (Italy), Danmar Computers LLC (Poland) and FyG Consultores (Spain). The project started in November 2018 and was expected to last for two years. Due to the COVID-19 pandemic and its impact, the project has been extended for six months.

Science camps

The PERSIST_EU methodology was designed during the Learning Teaching Training Activity in Valencia in June 2019. The international team prepared the questionnaire for the ICT tool and agreed on a common structure for implementing the SC in the partner countries. The event would last half a day and comprise watching a video about each of the four topics, discussions with an expert (for each topic), and peer-to-peer debate, before a final plenary session in which students would present their arguments about the topics. Before and after the SC, students were surveyed, in order to assess possible changes in perceptions and beliefs brought about by participation in the event. The selected experts included researchers, science communicators or journalists familiar with the topics. The consortium decided to organize the SC between January and April 2020.

In Portugal, the SC was scheduled to take place on the 21st March 2020. The recruitment began in February and targeted students from different fields of study at the University of Lisbon. The team used a variety of methods for promoting the SC and recruiting students. By the end of February, 28 students had enrolled to take part in the SC. Four experts had agreed to take part in the SC: two researchers from the University of Lisbon (CC+GMO), a public health consultant (VAX) and a hospital consultant (CAM).

On the 2nd of March Portugal reported the first two cases of COVID-19. Some days later, the University of Lisbon issued recommendations restricting the number of participants in university events and within a week the Rector made the decision to cancel all classes and close the university. On the 19th of March, the Government issued the declaration of a state of emergency and all citizens were asked to remain at home. The SC was thus cancelled.

In Germany the SC was scheduled to be held on the 24th of April which would have been during the first week of the summer term of 2020. Therefore, recruitment had just started when, on the 10th of March, the team decided to postpone the SC due to the beginning of the pandemic. At this point, it seemed reasonable to set a new date for the 20th of June, which also turned out to be unfeasible.

To draw attention to the scheduled SC and to reach students interested in subjects other than their own, interdisciplinary institutions at KIT as well as student bodies of all Faculties were asked to send out invitations to students. Social Media was used to raise awareness, too. Additionally, posters and leaflets were spread over Campus and local libraries. Since all these activities were conducted in a short time-frame, at the point of the cancellation only two interested persons had signed up.

Virtual Science Camps

The COVID-19 pandemic forced us to rethink the methodological approach of the SC. After discussions among the international team, it was agreed to redesign the format to make it suitable for an online platform. Some groups (Portugal, Italy, and Germany) decided to go ahead with the SC during the final semester of the academic year of 2020. Others (Spain, Slovakia) postponed them to the first term of the following school year.

Since most universities were holding online classes, a virtual format would not be overly unfamiliar or challenging for the students. However, adjustments had to be made and particular care had to be taken not to turn the SC into another online class. Online SC would have to be shorter, so a decision was made to separate the four topics into four different sessions, with a smaller number of attendants. Participants were sent a link to the questionnaire (about their perceptions and opinions about the topics) and a link to the video the week before the SC. Some incentives to participate were given: all participants would receive certificates and there would be a draw to win vouchers and tickets to events and museums.

The new design required a digital platform that could facilitate interactions between experts and participants, have no limit to people signed in, and allow screen sharing and breakout groups to facilitate discussions. For this, Zoom was selected in both countries.

In Portugal the SC were rescheduled to the 19th of May (CC), 20th of May 20 (VAX), and 26th of May (GMO). The SC about CAM proved to be much more difficult to schedule, since the initial invited expert was a medical doctor who was now working overtime because of the pandemic. This SC is now scheduled to happen on the 24th of September with a sociologist who conducts research on this topic.

Going online also required adapting the recruitment campaign. In Portugal, since the virtual environment posed no restrictions on participants' location, the team decided to expand recruitment to all higher education institutions. Furthermore, it was necessary to change the registration form: the participants could now select their preferred topics, according to their calendar, interests, and field of study.

The Portuguese Online SC were divided into three parts, each 30 minutes long. The first part was a brief introduction and a presentation from the expert who, instead of delivering a lecture on the topic, replied to questions sent beforehand by the students. In the second part, students were split into four rooms. Each room had a moderator and participants were asked to present arguments either for, or against, a specific statement related to the topic under discussion. In a closing plenary session, each group presented their arguments and

discussed the implications with the expert. Once the SC was over, students were asked to fill in the questionnaire again. The logistics of each virtual event required six researcher-facilitators: one host, one technical assistant, and four moderators in charge of the discussion rooms.

In Germany the new SC were re-scheduled to 11th of July (VAX+CAM), 22nd of July (CC) and 25th of July (GMO). All dates were supposed to be during the end of the current summer term. If one of these four dates or even all of them would not be successful, the plan was to redo SC in the winter term. In fact, two SC (CAM+GMO) had to be rescheduled because there weren't enough students signed up to participate.

Regarding recruitment no adaptations were made. We continued looking for participants only at KIT. For the originally planned face-to-face SC a registration platform linked to the central KIT administration was used. Due to a lack of capacity, the registration process could not be reorganized at short notice, this would have been necessary to recruit participants throughout Germany. Therefore, all the actions begun in March were resumed in June and July.

The schedule of the German event was similar to the Portuguese one. However, experts were asked to give a short keynote speech of a maximum of 10 minutes, followed by questions from the students. Also, the German students were divided into only two groups, which were assigned the task to give arguments for or against a given statement. Therefore, only four staff members attended one SC: two for moderation – in the joint section as well as the group discussions – and two for technical support and management of participants.

Benefits and limitations

According to the evaluation survey conducted after the SC in Portugal, most participants showed high levels of satisfaction with the dynamics and organization of the sessions. Students were very satisfied with the experts' intervention and their initial doubts were successfully clarified. Regarding the ICT tool, students said it is a very useful platform and easy to work with. In contrast with the results from February, which indicated friends and social media as the main sources of knowledge about the project, the survey shows that students knew about the Virtual SC through their university webpage or through an invitation by email. In Germany, the evaluation is still pending, but individual feedback after the SC supports the impressions described above.

In Portugal, the online event allowed us to reach a larger number of students, ensuring diversity in terms of geographical location (including students who were overseas) and fields of study. 153 students filled in the first questionnaire, 101 attended at least one of the three sessions (16 attended more than one), and 89 answered the survey for the second time. Regarding the overall experience, of the 61 participants who evaluated the sessions, 32 were highly satisfied and 27 were satisfied.

Recruiting students for virtual SC in Germany did not go as well as in Portugal. Only 41 students had signed up. There are two explanations for this: first, for the above-mentioned reasons, participants weren't recruited nationwide. Second, changes to examination dates, at short notice, had affected students' ability to participate. Therefore, four more SCs are to be carried out during the upcoming winter term. Recruitment will be tackled by asking professors to make SC a voluntary part of their classes.

The organisation of four online sessions reduced the risks of not reaching the required number of participants in a single face-to-face event, even though participants were not

exposed to all four topics. Nevertheless, there was a high number of dropouts between registration and the actual events, as some participants abandoned the session midway and others showed a very low level of engagement (did not participate in the discussions, kept their cameras turned off, were unaware that the session ended, did not reply to the second questionnaire). Yet, we acknowledge that similar problems could have occurred in face-to-face events, or even more severe problems, since it would have been a much longer session.

The favourable outcome of the online strategy can also be attributed to the characteristics of the target population, which had almost certain access to computers and the internet and the digital skills to operate them. The design of the project assumed as much, since some stages (filling in questionnaires online) already relied on ICT. Online participatory events may not work as successfully with other populations, such as deprived families or the elderly (Helsper and Galácz, 2009).

Going online also helped to make the proceedings more fluid and participatory, giving more time for each topic than we would have had in one joint afternoon session. (the four online sessions will total 6 hours, which would have been unfeasible in a live session). Also, on the face to face event participants would have to select one topic for developing pro/against arguments; online they had the opportunity to participate in all discussions. Since in Portugal experts received students' questions beforehand, they could prepare their answers in advance and keep to the time limits. Their presentations were tailor-made for that group of students, focusing on their doubts and questions. Online meetings further helped those students who may have been inhibited from asking their questions to the expert to contribute in a more sheltered setting, from their own, possible 'safer', space. On average, for each of the sessions, we received around 36 questions from 41 participants, a much higher number than for a face-to-face event. Also, there were more opportunities for discussion and for students to pose more questions. According to the students' reactions during the sessions, as well as the responses to the evaluation survey, the SC that were more positively evaluated were those in which the experts structured their interventions around the questions sent by the students and declared that they had to make some additional research in order to be able to answer them. This observation is supported by experiences from the German SC, as the round of questions following the experts' presentation began rather cautiously.

Using an online platform also allowed us to make good quality recordings of the SC discussions (with due authorisation from participants). The transcriptions will provide qualitative information concerning the perceptions and opinions of students about science. The results of the project are yet to be analysed.

Going online forced us to reschedule a few elements that were designed for the face-to-face SC. However, the opportunity the Portuguese team had to expand recruitment to the whole country was beneficial and allowed to engage a higher and more diversified number of participants who have completed all stages of the project. Relying in other universities to help disseminating the Virtual SC was an advantage. Conversely, the limitations to recruit outside of KIT in Germany has been a drawback. We also believe the dates had an impact on the way students' participated. The sessions that occurred before the evaluation period had less withdrawals. Students could dedicate more time and attention to the SC. During all stages of the SC it was clear that students wanted to be part of the project and were willing to give their opinion, Nevertheless, we think that having a draw for vouchers and tickets for events and museums helped to ensure that participants fulfilled all stages of the SC in Portugal

Overall, going online allowed us to meet the project deadlines with few losses in terms of results or involvement of participants, providing us more advantages than limitations.

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