The Art of Science Learning

WP4 Assessment Analysis of Goal 2
UK Case Study

Isabel Ruiz-Mallén, Maria Heras, Sandrine Gallois, Karla Berrens

Universitat Autònoma de Barcelona
Universitat Oberta de Catalunya

July 2017

European Commission | Horizon 2020 European Union funding for Research & Innovation

This project has received funding from the European's Union H2020 research and innovation program under grant agreement N° 665826

BRISTOL CASE STUDY - *Fairfield Field High School*

GOAL 2: CREATION OF THE PERSEIA

Methodology

As a way to examine the capacity of the workshops for reaching the Goal 2, involving the "performance's capacity to combine rigorous scientific content with aesthetic quality", we explored both the scientific and artistic aspects of the busks performed by students at the school.

To do so, we first collected general information on the context of the realization performance of the PERSEIA, by considering where it took place, the number of students involved in the busks, and the audience. Then, we assessed the final busks by considering both the artistic aspects and the scientific content. It is important to note that the artistic aspects have been approached and understood in the context of PERFORM, that is, an educational project fostering students' engagement with science and therefore, our aim is not to judge the artistic quality of the PERSEIA in a strict sense.

In this line, we also included as assessment criteria artistic elements emphasised by the science communicators during students' creation of the busks. Three elements have been observed: i) the inclusion of artistic elements that facilitators brought into the different workshops and that have been worked with the students all along the project; and ii) the use of performing resources, such as the use of space, light, music and attrezzo, and iii) the busk engaging capacity, as students' ability to connect with the audience (e.g. other students come to see the busk, pay attention, etc.) and to generate a dialogue afterwards. The assessment of the scientific content included: i) the weight scientific content took into the PERSEIA; ii) the accuracy and rigour of the scientific content transmitted through busking, and iii) the clarity of the communication of such scientific content. To do that, SMS team observed the busks when performed at the school and afterward filled in a written form documenting the above mentioned aspects. We have then complemented these data by watching the videos of the busks that SMS provided to us.

After the highlights, we first present the context in which the busks were performed by the students, and then results on the characteristics of the artistic elements and scientific content of the PERSEIAs played by each subgroup of students.

HIGHLIGHTS:

- The use of original props was key to engage the audience through creating surprise and laughter.
- Some groups used a 'roll up roll up' style, moving around the hall, to invite larger audiences while others preferred to create a more intimate atmosphere to capture the attention of small groups of people. Both approaches had a good effect in engaging people.
- The busk about sound was challenging because people had to be closer to be able to participate on it.
- Discussion between students performing and the audience was reported to be achieved in more than a half of the busks performed.
- Scientific topics were generally addressed with rigour as well as clearly communicated by the students through their busks.
- Despite laughter and collaboration was reported in many of the busks, some students reported in their surveys, learning charts and focus group they did not enjoy performing in front of their peers because they felt ignored.

Context of performance

Busks were performed in front of other students at the school's hall during lunch time. YR 9 students performed the busks. It is not possible to provide the number of performers because data from the written form and the videos did not match. What it is sure is that there were 7 subgroups each performing the busks. The number of people (students and teachers) who was reached was not recorded but it was relatively high.

As mentioned in Goal 4 report, students were nervous with the idea of performing their busks in front of their peers and showed contrasting views about the moment of the performance. Some of them really enjoyed the experience, and specifically the use of props, while others felt uncomfortable because they noticed the audience was not paying attention. Despite this, most students reported in their learning charts they improved their learning on the scientific topics of their busks.

Group 1: Sharks, balloons, bioengineering

This group included 2 boys and 2 girls as reported in the observation form, but the video showed 1 boy and 2 girls performing.

Artistic aspects

Students created a detailed tabletop activity by using the following props: gel, colourful lego, inflatable sharks. By using these props they provided clear messages to the audience, making the busk to look very visually attractive, quirky, and fun. Interestingly the busk had a gore factor since it was both attractive and repellent at the same time, which generated some discussion between the students performing and their audience.

Scientific content

Observations showed that scientific content was accurately addressed by the students during the busk. Their previous work during workshops with the ECR provided the busk with detailed information and rigorous scientific content that was mainly based on the ECR's bioengineering research.

Students' busk clearly communicated such content by trying to answer the following related question: how can we use proof materials in nature for bacterial defence? They also successfully implemented coordinated interventions.

Group 2: Taste: fruit pastilles, coloured water

This group included 1 boy and 2 girls performing.

Artistic aspects

As the Group 1, students used very colourful, visual props. Particularly, the use of sweets was very attractive to the audience.

Students adapted the busk while performing to make it work as well as it could in the space by moving away from their 'spot' to take the busk out to potential audiences not approaching them. In this regard, the fairground 'roll up roll up' style was used to good effect to invite audience in. Also, the group split during the busk and the boy – seemingly more keen to take the activity right up to any potential audience- moved around the room. His approach was very successful. This was very much in the spirit of good busking.

The group also achieved to reach discussion with the audience.

Scientific content

Students clearly communicated about how perception of taste is influenced by colour and other aspects of food's appearance. Scientific content was accurate and rigorous.

Group 3: Optical illusions

This group included 2 boys and 3 girls performing.

Artistic aspects

This group found the 'roll up roll up' style did not suit them of their topic so they developed a quieter style. Students successfully used a small space to create an intimate, collusive environment. Their quiet, gentle style worked well to draw the attention of the audience.

Students also achieved to generate discussion with their audience.

Scientific content

Scientific content on how visual perception can be altered by movement was accurately developed and clearly communicated by the students through their busk.

Group 4: Sound

This group included 2 boys and 2 girls according to the form, but the video showed 2 boys and 1 girl performing.

Artistic aspects

The props consisted of a couple of plastic glasses, cans, and paper glasses tied off. These props caused the students performing and the audience to use a lot of space. While the content and presentation techniques involving sound meant that few audience members could join in, those that did were very engaged. This led to other audiences being drawn in out of curiosity to hear the sounds that could only be heard when fully involved in the activity.

Lots of laughter and collaboration between audience and performers required and delivered to make the busk work.

Scientific content

The scientific content was accurately addressed.

However, the collusive style of the busk made it difficult for the observer to record whether the scientific content was clearly communicated by the students without interfering with the process.

Group 5: Banana piano

This group included 2 boys and 2 girls according to the form, but the video showed 2 boys and 1 girl.

Artistic aspects

The group had a very engaging activity that lots of people could try out, in small groups. Students performing used lots of eye contact, showing, telling and doing together.

They used the props, which were ordinary objects like bananas and aluminium paper, but also less usual ones like microchips. They used them to create music from touching bananas in a funny way, giving a real element of surprise and laughter, which was an effective busking method for drawing in audiences.

Scientific content

The group gave clear explanations to the audience, although the video showed that the two boys did not communicate a lot since the girl was the main speaker. The message had rigorous scientific content on electrical circuits and conductivity of different materials, specifically fruits.

Group 6: Miracle Berries

This group included 4 girls according to the form but the video showed 2 girls and 2 boys.

Artistic aspects

Students created an intimate environment at a slow and gentle pace when performing their busk. The busk consisted on a detailed tabletop activity with several steps for each audience because they were asked to first ate a fruit pastille with their eyes closed and then opened their eyes and drank three liquids of different colour that they had to guess what they were. This resulted in a long engagement, lots of laughter and surprise.

Buskers used lots of detailed, friendly conversation and invited the audience to discussion. Several of them could operate at the same time with different small audience groups of one or two people so the environment was one of boost discussion.

Scientific content

Scientific content addressed chemicals that temporarily shut off or alter taste receptors. It was also related to different colours. It was accurately addressed. The group also gave clear explanations to the audience.

Group 7: Sound (straws, gloves)

This group included 2 boys and 2 girls.

Artistic aspects

Students performing used an enclosed space and created an intimate, humorous atmosphere.

The busk had two parts running concurrently, keeping small audience groups engaged, with more for them to move on to after doing one part. Also, the busk had a large peculiar prop that kept such a busy environment and engaged several people at the same time.

Scientific content

The busk accurately addressed how sound travels and related pitch changes. The group clearly communicated it to the audience.