Susciter une éducation plus intégrative par les arts du spectacle : Retours d'un projet de recherche collaboratif international sur le développement de méthodes innovantes pour l'enseignement des sciences

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Structure of the talk

1. Presentation of the PERFORM Project
2. Description of PERFORM Workshops
3. PERFORM Workshops’ Assessment
4. Insights from the Assessment
Overall Framework

Few students’ interest in science learning

Overall gap between science, scientifics and civil society, especially youth

*European Commission / Annual Eurobarometers*

Science education is crucial for boosting a more critical and democratic citizenship able to deal with current complex socio-environmental challenges in responsible ways
PERFORM Project

Participatory Engagement with Scientific and Technological Research through Performance

Exploring new science education methods based on:
the performing arts and
the direct interaction and communication between young people and researchers
to foster young peoples’ motivations and engagement with STEM
(Science, Technology, Engineering and Mathematics)
PERFORM Project

- Protocols of tested methods
- Co-producing innovative methods in STEM education through performing arts with and for students (WP2)
- Building capacity for teachers and early career researchers in teaching and communicating STEM (WP3)
- Toolkits and guidelines
- Assessing the impact of the participatory educational process in fostering students’ motivations and engagement in STEM (WP4)
- Communication, dissemination and exploitation of the research results for widespread policy adoption (WP5+6)
- Policy briefs on-line and off-line
- RRI values and transversal skills indicators
PERFORM Project

Science Made Simple (SMS)
www.sciencemade simples.co.uk

University of Warwick (UoW)
www.warwick.ac.uk

University of Bristol (UoB)
www.bristol.ac.uk

Les Atomes Crochus-TRACES
www.groupe-traces.fr

Les Ateliers des Jours à Venir (AJA)
www.joursevenir.org

Universitat Autònoma de Barcelona (UAB), www.uab.cat

European Science Events Association (EUSEA),
www.eusea.info

UNESCO
www.unesco.org

COORDINATOR
Fundació per la Universitat Oberta de Catalunya (UOC)
www.uoc.edu

The Big Van Theory (TBVT)
www.thebigvantheory.com
PERFORM Project

Protocols of tested methods

Co-producing innovative methods in STEM education through performing arts with and for students (WP2)

Building capacity for teachers and early career researchers in teaching and communicating STEM (WP3)

Toolkits and guidelines

Assessing the impact of the participatory educational processes in fostering students' motivations and engagement in STEM (WP4)

Communication, dissemination and exploitation of the research results for widespread policy adoption (WP5)

Policy briefs on-line and off-line

RRI values and transversal skills indicators
PERFORM Workshops

Innovative methods developed in STEM education through performing Arts **with and for** students:

- To promote students’ learning and reflection about STEM concepts, scientists’ practice and impacts and applications of science in their daily lives.

- To foster students’ acquisition of the values embedded in the Responsible Research and Innovation approach (RRI)
PERFORM Workshops

1st round of Participatory Workshops

Three countries, Five schools

127 Students (UK 22+ FR 42+ SP 63)

From January to May 2017
PERFORM Workshops

Based on students’ interest, they chose a research question they develop in order to create a performance about it.

All along the process of the project among the schools, students are accompanied in their research, combining reflection activities and exercises of scenic arts to allow them to integrate different aspects of RRI values and Transversal Competences.

In parallel, scenic arts skills and body awareness tools are fostered by the realization of different exercises.
PERFORM Workshops

6-7 sessions two hours each
1 science communicator and performer;
    1 teacher
1 Early Career Researcher
10 to ≈ 20 students by group

FR: Theatre piece (improvisation)
SP: Monologs
UK: Busking
PERFORM Workshops

Transversal Competences

**Learning to learn skills**
students’ ability to pursue and organize their own learning in accordance with their needs, and to the awareness of learning methods and opportunities.

**Civic & Social Competences**
personal, interpersonal and intercultural skills and forms of behaviour that equip individuals to participate in an effective and constructive way in social and working life.

**Sense of Initiative & Entrepreneurship**
Students’ ability to turn ideas into action.
PERFORM Workshops
Responsible Research & Innovation Approach

**Process Requirements of the workshops:**

- **Diversity and Inclusion**
  Science education should cover a wide range of disciplines and engage diversity of stakeholder within the different stages of R&I

- **Anticipation and Reflection**
  Learners should be empowered with the skills to critically analyse R&I and anticipate its impacts, thereby contributing to debates

- **Openness and Transparency**
  Science education should focus on real-life challenges and link them to current R&I

- **Responsiveness and Adaptive Change**
  Students should participate in learning activities where they may help find solutions to societal challenges

**To foster within the workshops:**

- **students’ creative and critical thinking**

- **Students’ emotional engagement**

- **students’ reflexion on gender & ethical issues**
PERFORM Workshops

Each workshop was divided into different activities:

**Reflexion activities**
- Writing supports
- Oral supports - Debate
- Critical Thinking
- Gender aspects
- Human and Social dimension of Science
- Ethics in Science

**Theatrical exercises**
- Student ideas’ embodiment
- Voice and Regard
- Memory
- Students’ relation with the other and the space

**Students’ performance construction**
Project Assessment

How and to which extent the structure of these workshops allowed students to get involved in their own reflection about science?

How did the students engage during the workshops?
What did they report having learnt during the workshops?
What were the aspects they enjoyed the most during the workshops?
Project Assessment

The evaluation used a mixed methods approach:

- combining both qualitative and quantitative data

- with all the stakeholders involved in the workshops (Students, Teachers, Researchers, Science Communicators)
Project Assessment

- **Before the workshops**
  - Students’ structured Surveys on their perceptions towards science & science learning

- **During the workshops**
  - Systematic & structured Observation of the workshops
  - Students’ self evaluation of their learning process

- **After the workshops**
  - Students’ structured Surveys on their perceptions towards science & science learning
  - Students’ Focus Group

- W1, W2, W3, W4, W5, W6, W7

- Teachers’ Interviews
- Researchers’ Interviews
- Sc. communicators’ Interviews

- Final REPRESENTATION
Main insights

Students’ engagement in the workshops

– Balanced participation of all the students thanks to:

  • The combination of activities realized in subgroups and activities involving the whole group of students

  • The combination of activities of reflection and theatrical exercises
Main insights

Students’ engagement in the workshops

– Higher involvement when using oral supports than written ones

– Higher involvement when working on students’ own research questions than on other topics approached
Main insights

Students’ relation with the young researchers

Students show a high interest towards ECRs’ talks and sharing on their research and daily life

Most of them reported they wish they could have more interaction with the young researchers

Most of them reported that interacting with young researcher gave them a broader overview on what might be a scientist
Main insights

Students’ perception of the Workshops

« what did they **enjoy the most** during the workshops ? »

To realize the theatrical exercises and the final PERFORMANCE (especially in FR)
Main insights

Students’ perception of the Workshops

« what did they _enjoy the most_ during the workshops ? »

To be part of the creation of the Performance and to practice it
Main insights

Students’ perception of the Workshops

« what did they **enjoy the most** during the workshops ? »

To have fun as a driver for science learning

« *I liked that we learnt and had fun at the same time. I’ve learnt things about science, even me, that I don’t like science and normally do not pay much attention*» (Girl, SP)
Main insights

Students’ perception of the Workshops

« what did they **enjoy the most** during the workshops ? »

To Socialize and to experiment a Collaborative learning

Students reported they enjoyed being able to socialize with their mates and other pupils they did not previously know

“*Through performing, group tasks and activities. I liked how we wrote on the sheet the ideas we had and we rotated to different groups to write on their sheets. That made planning our busks easier because we had input from others.*” (Girl, UK)
Main insights

Students’ perception of the Workshops

« what did they learn thanks to the project? »

Critical thinking

« I have learnt that we subconsciously judge people based on looks, gender, and body language » (UK)
Main insights

Students’ perception of the Workshops

« what did they learn thanks to the project? »

Learning autonomy (reported by the teachers)

*In Spain, they emphasised students’ capacity to take ownership of the process towards the end and to improvise as some tense situations were emerging, through their capacity to creatively adapt to new situations and be innovative.*
Main insights

Students’ perception of the Workshops

« what did they learn thanks to the project? »

Oral Skills

Also recognized by teachers

“This really helped her a lot. Then, I asked them to prepare a text and to read it, and she was the one who read it the best, [...] we could hear her really well, with no grip, and she is dyslexic. This experience really raised her.“
Main insights

Students’ perception of the Workshops

« what did they learn thanks to the project? »

Gaining Self Confidence

Also recognized by teachers
Main insights

Contexts that allowed such outcomes

Climate of trust
Fostering dialogue
Use of humour
Attention towards students’ needs
Emotional support
No competition
Conclusion

In order to foster students’ engagement into science learning through an inclusive way, this process allows us to highlight the importance of:

– Proposing a diversity of practices and approaches fostering students’ active learning, and involving the cognitive, physical and emotional engagement

– Allowing students’ curiosity to be the driver of the process of learning
Conclusion

In order to foster students’ engagement into science learning through an inclusive way, this process allows us to highlight the importance of:

– Offering students the opportunity to express their ideas through physical and emotional pathways in a climate of trust, respect and no judgement
Contact

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