CREATIONS: Infusing creativity in science education through the arts

Angelos Alexopoulos (CERN)
On behalf of the CREATIONS Consortium

CREATIONS
Developing an Engaging Science Classroom

Funded with the “Horizon 2020 Framework of the European Commission”
Scientific knowledge is the product of creative thinking (Osborne et al., 2003)

Art is an excellent tool to help students learn science (Ashley, 2011; Merten, 2011)
What is STEAM?

STEAM is an educational and innovation framework bringing science, technology and engineering together with the arts/other disciplines and types of learners with the goal of being more engaging, creative and naturally successful for all members of any educational system.

Top 10 skills

<table>
<thead>
<tr>
<th>Rank</th>
<th>Skill</th>
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<tbody>
<tr>
<td>1.</td>
<td>Complex Problem Solving</td>
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<td>2.</td>
<td>Critical Thinking</td>
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<td>3.</td>
<td>Creativity</td>
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<td>4.</td>
<td>People Management</td>
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<td>5.</td>
<td>Coordinating with Others</td>
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<td>6.</td>
<td>Emotional Intelligence</td>
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<td>7.</td>
<td>Judgment and Decision Making</td>
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<td>8.</td>
<td>Service Orientation</td>
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<td>9.</td>
<td>Negotiation</td>
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<td>10.</td>
<td>Cognitive Flexibility</td>
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Source: Future of Jobs Report, World Economic Forum
Students who are involved in the arts are:

- 4 times more likely to participate in a math & science fair
- 3 times more likely to win an award for school attendance
- 4 times more likely to be recognized for academic achievement

Source: Americans for the Arts (2013)
1st SciArt workshop, Jun 2013, Graz, Austria

62 students
2 schools
4 HEPHY scientists
2 art teachers
2 science teachers

The Incredible Science-Art Collider by students in Graz, Austria (Image: Michael Hoch)
4 years later...

>1,000 students
in 7 countries
Vision

- Transfer the research infrastructure culture to schools
- Introduce creativity to science education
- Foster everyday creativity in students
- Generate alternative strategies of scientific inquiry
- Engage students in imaginative activities
- Generate original and valuable outcomes

*Image: Bob Krist/CORBIS*

*Creativity is the process of applied imagination.*

*Sir Ken Robinson*
Roadmap

Pedagogical Framework (WP2)

Demonstrators (WP3)

User Needs & Visionary Workshops (WP3)

Implementation Activities (WP5)

Teacher Training & Support (WP4)

Evaluation (WP6)

Participatory Engagement Activities (WP4)
Pedagogical features

Risk, immersion and play

Individual, collaborative and communal activities for

Balance and navigation

Interdisciplinarity

Dialogue

Ethics and trusteeship

Possibilities

Empowerment and agency
Pedagogical features

1. I/we want to know why...? What are the reasons...? What would happen if...? What if...? I/we wonder...? Suppose that...?
2. Evidence: observe, measure, record
3. Analyse: describe, expect, notice?
4. Explain: what, why, how?
5. Connect: connect, extend, challenge, question
6. Communicate: explain, share, demonstrate, present
7. Reflect: what do I wonder now?
Teacher training & support

CREATIONS
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Creations Summer School 2017
Attica, Greece | 02/07 - 12/07/2017
Teacher training & support

CPD courses

Masterclasses

PLAYING WITH PROTONS
UK CPD COURSE
21-25 AUGUST 2017
CERN

Bringing together UK primary teachers, science education specialists and CERN scientists to develop creative approaches for engaging Key Stage 2 students with science, technology and innovation.
CREATIONS implementation activities

up to 7 July 2017

288 Activities
596 Schools
12,447 Students
1,192 Teachers

In the first week of March 2017, the STFC Rutherford Appleton Laboratory (RAL) ran their annual Particle Physics Masterclass, reaching over 700 A-Level students and teachers. Each day included a series of engaging workshops and lectures, with opportunities for students to interact with experts in the field.

Ghost Particles - a Global Science Opera - the full broadcast

Cultural Collisions at CERN

Learning Science through Theater

Particle Physics Masterclass + Photo Contest
Art & Science across Italy

3K students

38 schools

5 cities

70h project work per school year
Venice

- 4 schools
- 350 students
- 6 seminars by AMVA4NewPhysics PhD students
- 39 artworks by 94 students
- 17 artworks exhibited at EPSHEP2017
Particle Physics Masterclass Photo Competition

Incredible Science, Inspirational People, Astounding Places...

605 students  86 teachers  48 schools

Rutherford Appleton Laboratory
@STFC_Matters
Introducing Students to HEP: Fine Arts & Dance

Check UniBham poster on 3rd floor!

Physics & Fine Arts
Particle Dance
Neutrino Passoire

Follow the action on Twitter!
@PP_UniBham @kostas_nikolop
Global Science Opera

294 students   40 teachers   16 schools   14 countries
Stay tuned!

Web:  www.creations-project.eu

@CreationsEU
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