



Grant agreement No. 640979

ShaleXenvironment

**Maximizing the EU shale gas potential by minimizing its
environmental footprint**

H2020-LCE-2014-1
Competitive low-carbon energy

D12.5 Summer Challenge 1/2

WP 12 – Dissemination

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Duration	36 months
Lead beneficiary	NSCR'D'
Last editor	Pauline Chetail (UCL)
Contributors	Alberto Striolo (UCL), Pauline Chetail (UCL)
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History of the changes

Version	Date	Released by	Comments
1.0	04-08-16	Alberto Striolo	First draft circulated internally at UCL
1.1	14-10-16	Pauline Chetail	Second draft circulated to the consortium for comments and approval
1.2	07-11-16	Pauline Chetail	Final draft approved by all partners

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Key word list

Public Dissemination, Outreach, Pre-University Students

1. Introduction

- Summer Challenges are summer outreach events held in collaboration with the UCL Widening Participation Office. They target Year-12 students who come from under-represented backgrounds. In the UK, Year 12 students spend one last year in high school before joining a university, if they so choose and if they are accepted.
- Deliverable 12.6 has the goal of attracting young students to STEM disciplines, and to introduce them to the scientific and technological facts that underpin hydraulic fracturing and shale gas.
- The objectives of this deliverable are:
 - (1) show to pre-university students what university is, in particular in engineering; and
 - (2) discuss the hydraulic fracturing technology, the possible environmental impacts of shale gas, and possible remediation strategies.

1.1 General context

The UCL Widening Participation Office coordinates a number of outreach activities meant to attract students from under-represented backgrounds to engage in university degrees. Among other initiatives, this office organizes the Year 12 Summer Challenge:

www.ucl.ac.uk/prospective-students/widening-participation/activities/summer-challenge

As part of the SXT proposal, the UCL team has organized the Summer Challenge titled 'Engineering Solutions from Nature'. The program has been organized in collaboration with colleagues within the Chemical Engineering Department, the Biochemical Engineering Department and the Institute of Making at UCL. Representatives from GSK also participated.

1.2 Deliverable objectives

The objectives of the Summer Challenges are:

- (1) to attract the young students to a university, and possibly to entertain a career in STEM degrees – to do this we decided to show the students what the university looks like, and in particular what degrees such as Chemical and Biochemical Engineering offer; and
- (2) to openly discuss the technology of hydraulic fracturing, the potential environmental footprint of the shale gas, and possible remediation measures.

2. Methodological approach & Background information

The Widening Participation Office screened proposals from various UCL departments, and awarded the one titled 'Engineering Solutions from Nature' funding for carrying out the event. Additional funds were obtained by the Centre of Nature Inspired Engineering, which is funded by the Engineering and Physical Sciences Research Council ([EPSRC](#)). These funds were used to financially support 4 post-graduate students in the department to organise the event. The 4 post-graduate students, identified as Moderators in the narrative below, were:

- Dina Ibrahim Aboulamaiem
- Tai Bui
- Maria Apostolopoulou
- Oluwamayowa Amusat

The Widening Participation Office established contacts with secondary-schools in the greater London area, advertised the program, screened applications and organised the logistics for the event, which ran for 7 weeks and ended on July 26th, 2016.

To be admitted, the students need to have grades sufficiently high that they could be accepted by UCL for their university career, and they need to be 'first-generation' university students in their respective families. The focus of this event is in fact on students that, if not encouraged, might opt not to pursue an academic career.

The selected students came to UCL once per week, on Tuesdays, for 2 hours. During those 2 hours they were given lectures, tours, instructions, etc., as discussed below. The students were assigned an individual project, to be completed within the 7 weeks.

Upon successfully completing the Summer Challenge, the students can apply to UCL for their university career. Those students who will be accepted by UCL to start in the 2017-2018 academic year will qualify for the 'London Opportunity Scholarship', which can provide £4,000 per year for 4 years (more information on the [UCL website](#)).

3. Summary of activities

The Summer Challenge consisted in a series of lectures, visits to laboratories, and discussions. Contributors came from the Chemical Engineering Department, Biochemical Engineering Department, Institute of Making, and GSK.

The full list of activities is listed below (note the discussion on shale gas in Week 5).

Week 1 – June 14th 2016

4:30 to 5:00	<ul style="list-style-type: none"> ▪ Ice breaker ▪ Introduction of the students, of the moderators ▪ Welcome to the challenge, brief overview on Chemical Engineering at UCL (Alberto Striolo) ▪ Project description – energy storage / production SigmaXI 2015 Projects: https://www.sigmaxi.org/student-showcase
5:00 to 5:30	Jason Cho Nature-Inspired Chemical Engineering
5:30 to 6:00	Discussion led by Moderators : how can nature inspire the projects?
6:00 to 6:30	<ul style="list-style-type: none"> ▪ Questions on projects, Moderators team up ▪ Projects expectations and workplan Choice of project by week 2, Workplan by week 3, Work at home during week 4 (reading week), Overall project by week 5, Presentation and write up by week 6, Completion at week 7.

Week 2 – June 21st 2016

4:30 to 5:00	Welcome, and discussion on what will be presented (Moderators)
5:00 to 6:00	<ul style="list-style-type: none"> ▪ Visit to experimental facilities ▪ Panagiota Angeli – tour of fluid dynamics facilities ▪ Asterios Gavriilidis – tour of reaction engineering facilities
6:00 to 6:30	<ul style="list-style-type: none"> ▪ Discussion led by moderators ▪ Project choice confirmation (4 groups)

Week 3 – June 28th 2016

4:30 to 5:00	<ul style="list-style-type: none"> ▪ Project work plan (Moderators) ▪ Discussion on what will be presented (Alberto Striolo)
5:00 to 6:00	<ul style="list-style-type: none"> ▪ Mark Miodownik – Institute of Making ▪ Brenda Parker – Biochemical Engineering
6:00 to 6:30	<ul style="list-style-type: none"> ▪ Discussion led by Moderators ▪ How are these facilities useful for the project? ▪ How could you use the Biochemical Engineering labs?

Week 4 – July 5th 2016

	Reading week Individual work on projects
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Week 5 – July 12th 2016

4:30 to 5:15	Alberto Striolo <i>Shale Gas in Europe: The Hydraulic Fracturing Technology and its Environmental Footprint</i>
5:15 to 6:30	Andrew Richards and Thoralf Hartwig (Glaxo Smith Kline) <i>Chemical Processes in the Pharmaceutical Industry</i>

Week 6 – July 19th 2016

4:30 to 5:20	Dan Brett <i>Fuel Cells: Powering the Future?</i>
5:20 to 5:45	Fuel Cells Demo (Dina Ibrahim)
5:45 to 6:00	<ul style="list-style-type: none"> ▪ Discussion led by Moderators ▪ Short presentation on projects ▪ How will you incorporate this knowledge in your projects? ▪ Presentation skills
6:00 to 6:30	George Manos The process of application to UCL Chemical Engineering department

Week 7 – July 26th 2016

4:30 to 4:45	Hand-in reports
4:45 to 6:00	Students' project Presentations
6:00 to 6:30	Michail Stamatakis (highlight of current research) Speeding Up the Slow Ones
6:30 to 7:00	Closing celebration and presentation of awards (with UCL Widening Participation Office)

Students who completed the Summer Challenge

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|-----------------------|--------------------|
| ▪ Samuel Adetula | ▪ Danial Qadeer |
| ▪ Jahid Hasan | ▪ Rhema Richardson |
| ▪ Prabahar Jegaruban | ▪ Gelmu Sherpa |
| ▪ Thashanth Jeyakumar | ▪ Nayab Siddique |
| ▪ Mariam Khan | ▪ Zakaria Yusuf |

4. Conclusions and future steps

This Summer Challenge has been completed. 10 pre-university students completed all the activities, and submitted a project report. They are eligible for the London Opportunity Studentship, if they successfully apply to become UCL students starting in 2017-2018.

Many topics were discussed during the Summer Challenge, and we are awaiting students' feedback. The success of the initiative will only be known in 2017, when the students will apply to universities for their education. Perhaps next year the Summer Challenge should focus a little more on shale gas, and can include the results of the SXT research.

