

Think Like A Scientist



Course: *HMP Low Newton 2019*

Instructor: *Dr Phil Heron*

Think Like A Scientist was a science course taught at HMP Low Newton once a week for seven weeks between 22nd January and 5th March 2019. It was the first course of its kind to be taught in England. *Think Like A Scientist* is funded through European Union's Horizon 2020 research and innovation program under the Marie Skłodowska-Curie grant agreement No. 749664.

The course was centred around three main tenets of being a scientist: understanding, analysis, and communication. For the duration of the class, the students engaged in thinking like a scientist to learn about a topic, analyse the current research, and communicate their findings.

In a world where 'fake news' is a real danger, the course offered students the basic building blocks required to think like a researcher, guided by the scientific method as a tool to gain understanding (e.g., what are we trying to find out? how do we test that? can we confirm a result? what else do we need to know to be sure of our findings?).

Each class lasted 2.5 hours and had the same basic framework: introduction to the main science topic; activities surrounding the main topic; assignment of main topic reading to be summarized and analysed; analytical skills best practices; and a section on improving communication skills. The topics covered were The Science of Sleep, Climate Change, Plate Tectonics, The Solar System, The Universe, and Robots/Artificial Intelligence. The last topic was delivered by Prof Danielle George MBE.

During the course, the students collected data for their own experiment ('Does the amount of sleep you get impact mood and/or energy levels?'). The students were required to understand and analyse the data and to communicate the findings in a report.

In the final week, the students taught the class. Each student educated the room on an assigned scientist that may be chosen for the Bank of England's #ThinkScience campaign to choose the new face of the £50 note. As a group, we voted for Alan Turing.

For completion of the course, the student attended ~18 hours of class, wrote 6 assignments and taught the class for 10+ minutes in the final project. I am happy to be contacted to discuss further the course and the teaching methods (student feedback below).

Dr Phil Heron

philip.j.heron@durham.ac.uk

Marie Skłodowska-Curie Independent Fellow

Durham University

5th March 2019

Think Like A Scientist



Course: *HMP Low Newton 2019*

Instructor: *Dr Phil Heron (philip.j.heron@durham.ac.uk)*

Written feedback on course (from four students):

- My mind feels like it has expanded, and I no longer feel like that stupid kid that never holds their hand up and holds their breath when the teacher asks a question.
- It was an amazing opportunity - like a live TED video just for me each week.
- It gave me a better understanding of all the topics covered and re-awakened my curious side.
- I am gaining a sense of confidence academically I never thought I had in me. That I do have a view and ideas and a thirst for knowledge - this course has ignited that.
- The course has given me more confidence and made me understand and see the world and universe around me in a different light.
- I never got to go to college or university the way I planned when I was younger - this gave me a tick on the bucket list and for a few hours I felt like I lived a dream.
- The way the course was delivered was exceptional and made easy to understand.
- At school I hated science but each week I couldn't wait until Tuesday to learn all these things I never knew.
- I enjoyed every single week even the ones I originally wasn't interested in.
- I would do all the weeks all over again.
- For the first time since college I enjoyed doing the homework.
- I really enjoyed all the coursework, but especially the Geoscience as I love volcanoes and earthquakes.
- I found the course exciting.
- I loved every second of it.
- I learned so much and I still want more.
- I will be so sad now it has finished.

Written feedback on instructor (from four students):

- The feedback I received each week was like receiving a prize - I've never felt like this and it means so much to me.
- I enjoyed all the weeks in the course, but I think it was the instructor and the way he taught and discussed the topics we did each week that made the sessions exciting.
- Thank you Phil for your energy and guidance and for teaching us and making us feel human.
- The guest speaker inspired me to write a story (I haven't yet but now have the bare bones for one).
- Phil is an amazing instructor who makes learning a fun experience, he explains things in a way you can understand and leaves you wanting to expand your knowledge.
- To be able to attend a class with a professor every week was incredible, let alone two when we had a guest speaker. It was AMAZING.

N=4

Rate the statement as it relates to you:

	<i>Strongly Agree</i>	<i>Agree</i>	<i>Neutral</i>	<i>Disagree</i>	<i>Strongly Disagree</i>
1. "The instructor increased my interest in science"	100%	--	--	--	--
2. "The instructor was knowledgeable of the subject being taught"	100%	--	--	--	--
3. "The instructor was enthusiastic about the subject"	100%	--	--	--	--
4. "The instructor encouraged students to think for themselves"	100%	--	--	--	--
5. "The instructor was clear in presenting the material"	100%	--	--	--	--
6. "The instructor was receptive to questions and/or discussions during class"	100%	--	--	--	--
7. "The course overall was interesting"	100%	--	--	--	--
8. "I would take this course again"	100%	--	--	--	--
9. "The after-class work was set at the right education level"	75%	25%	--	--	--
10. "I learned a lot during the course"	100%	--	--	--	--
11. "The after-class work was useful"	75%	25%	--	--	--
	<i>Strongly Agree</i>	<i>Agree</i>	<i>Neutral</i>	<i>Disagree</i>	<i>Strongly Disagree</i>

Phil Heron (philip.j.heron@durham.ac.uk)