Student Feedback

Course: *Think Like A Scientist 2019*
Instructor: *Dr Phil Heron*
Website: **www.philheron.com/think-like-a-scientist**

Overview of course:

In 2019, students from three different prisons in England participated in *Think Like A Scientist*, a 7-week prison education course that teaches critical thinking and encourages independent thought. The students contributed to discussion on a different scientific topic each week, which included science of sleep, climate change, natural hazards, space missions, the universe, and artificial intelligence. Through dialogic teaching methods and guided by a critical thinking framework, the students provided a valuable contribution to the class by analysing current research and communicating opinions on the topic. The following is feedback from students who have taken the course.

Pre-course questionnaire:

Below are the responses from the pre-course questions.

N=27
Rate the statement as it relates to you:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
"I read about science in my free time"	15%	26%	19%	19%	22%
"I enjoy learning about scientific discoveries"	52%	30%	15%	--	4%
"Science is for everyone"	44%	11%	15%	19%	11%
"Science is creative"	48%	41%	11%	--	--
"Science is difficult"	33%	15%	41%	7%	4%
"I am confident speaking in front of people"	22%	30%	26%	11%	11%
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

Why are you taking this course?

- I would like to improve my knowledge of the sciences, challenging myself and moving out of my comfort zone
- I would like to come out of this course with a better understanding of science, I believe that knowledge is power and a gateway to improve yourself.
- Thilled we were given the chance to attend a unique course and jumped at the chance of being part of something different
- To get some ideas and improve my knowledge of science so I can eventually combine it with my creative writing course
- I also hope to increase my condifence and my ability to communicate complex ideas
- I enjoy learning about new things and I'm quite open minded.
- It fascinates me how the brain works and how can change pattenes in your brain by thinking differently
- I also am interested in learning more about climate change and how we are or can be more responsible in our actions to make positive contributions to the environment we live in
- I enjoy learning and wanted to learn new things
- develop my knowledge base and understanding around science with all or some of IGS branches
- To learn and get a better understanding about science
- to learn more about different scientific discoveries
- I am always interested in learning about things I don't understand or even learning more about topics I have knowledge in
- Improve my knowledge base from a wide range of scienfitic insight
- To learn something I don't know
- It has been a long time since I read or studied science
- I enjoy learning especially if it is a topic I am interested in
- I've always been interested in anything to do with science and I'm always looking for the next big scientific discoveries
- I reallly enjoy science, always have. I like the eugenics side of it, but mostly I like the space side of it (new planets, dark matter, comets, and all the things we don't know yet)
- I enjoy learning about things that are usually out of my reach
- I am intregued to learn something new about science, to broaden my horizons
- Learn more about science
- Because I like Phil

Expectations for the course?

- Open the door to new pathways of learning
- To know more about science
- I expect this to be interesting

- that we cover a lot of different types of science
- Just to learn more than I already know and to have a laugh
- to expand my scientific knowledge
- we cover a wide range of science
- Ignite the love for science again
- I hope there is a lot of variety in scientific knowledge /info and an open learning environment
- That I will learn about the different sciences - better understanding of each
- To explore numerous areas of science
- expand my mental horizon

What is your best way to learn?

- visual as well as reading booklets and group chat
- read, watch and do
- communicating ideas, group work, reading
- listening, studying, reading
- talking and doing
- hands on
- pracitical/talking
- visual
- read about or watch on TV or talk about
- practicing or reciting info learned
- listen and ask
- reading and talk about
- I enjoy learning alone, but it is more fun in a group
- reading and taking part
- try everything you haven't done before, listen and be willing to learn
- listen and try it out
- I enjoy practical work and experiments
- seeing them
- to try
- discussion

Additional thoughts?
- This is a very positive class for anyone in the prison system who dared to dream.
- We many people lack understanding and are scared of learning, this is a chance to break the mould.
- I'm excited to see what I can learn in 7 weeks
- I am really looking forward to to this course and being able to improve myself in a field I have not venutred into since my school days.
- Thank you for coming

- what is the first topic?
- I want to think like a scientist
- how long do you reckon a baby bel would last in open space?
- Thanks for taking the time to do this. I'm looking forward to it
- Would like to know more about the universe, as it is my chosen subject
- Look forward to it!

Post-course questionnaire:

Below are the responses for the post-course questions.

N=20
Rate the statement as it relates to you:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
"I read about science in my free time"	25%	15%	50%	10%	0%
"I enjoy learning about scientific discoveries"	50%	45%	5%	0%	0%
"Science is for everyone"	30%	30%	30%	10%	0%
"Science is creative"	50%	40%	10%	--	--
"Science is difficult"	15%	25%	45%	10%	5%
"I am confident speaking in front of people"	45%	20%	15%	10%	10%
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

Has the course helped you in any way?

- Yes, it gave me a better understanding of all the topic covered and re-awakened my curious side.
- It has made me think more about a lot of topics
- 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.
- In turn, my mind feels like it has expanded and I no longer feel like that stupid kid that never holds their hand up and hold their breath when the teacher asks a question
- It helped me understand more about the environment we live in and how to better understand what each person can do to help save the world we live in

- Yeah, during the course Phil recommended I read a book on sleep patterns. In doing so, I've conducted my own sleep experiment which has improved my sleeping times. This putting me in better stead to wake up in here every morning. It has really helped.
- Yes, it has made me think like a scientist and broaden my thoughts
- Yes, it allowed me to learn more about subjects I hadn't really touched upon
- It has helped my understanding of the importance of sleep and the wonders of space
- Helped me re-engage with science again
- Gave me a better understanding of geoscience, space missions, and robots/AI
- We discussed a wide range of scientific topics which improved my knowledge base which I hoped the course would do
- Gave me information about the world
- Discussed various topics expanding my interest
- I learned a few things and I always love learning something new
- It has made me realise a lot about the world and myself
- Yes it has - I will never look at the sky the same way

Did the course meet your expectations?

- It more than met my expectations
- Yes it was very informative and it met all of my expectations
- Above my expectations.
- At school I hated science but each week I couldn't wait until Tuesday to learn all these things I never knew
- Yes, it was very interesting and kept me engrossed in each topic
- It exceeded my expectations. Every topic was exciting!
- Yes and beat them by a mile
- Yes, it was very informative
- Mostly yes
- Partly! I wish we went deeper into some topics
- The course met my expectations
- Yes, even though I didn't attend all the lessons I did enjoy the ones I did attend
- NO! because I want more time
- It exceeded my expectations. Every topic was exciting!
- Yes defiantly, there's not much I look forward to in here but this course was something that I did look forward to
- Yes, it was better than I thought it was going to be
- Definitely

What was the best part of the course?

- 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.

- The way the course was delivered was exceptional and made easy to understand
- All of it, for the first time since college I enjoyed doing the homework
- The whole program, I thoroughly enjoyed every topic presented to us
- I loved every second of it.
- 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.
- I enjoyed all the course, even learning about topics I was not clued up on
- The course itself was the best thing. The variety of topics were perfect!
- The best part of the course was about space and the universe
- There were no bad parts at all, Phil was excellent
- The best part of the course was the group interaction, it allowed everyone to express their views and discuss them
- The best part is the conversation
- Th best was on AI - very enjoyable
- The best part of the course was learning about space.
- Learning about the different subjects as a lot of it I didn't already know
- The tutor
- I enjoyed all of the course, there was nothing that I didn't really enjoy
- The best part was about aliens, deep space, and black holes
- I've enjoyed every lesson but my favourite one was volcanoes and mother nature
- I liked when we learned about volcanoes and we learned about space

What was the worst part of the course?

- The worst part of the course was that due to it being held in prison, some people will apply for just something to do. Which isn't necessarily a bad thing, it's just you'll always get some that want to be there just to get out of a cell, so will end up disrupting a class from time to time.
- The worst part is the length of the course - I wish it was much longer
- The worst part of the course was that sometimes it felt like we drifted off the topic when someone raised a point that relates but wasn't relevant to the point that was being made, making information difficult to digest.
- Only 7 weeks
- Length of the course

Any additional feedback?

- I really enjoyed all the coursework, but especially the Geoscience as I love volcanoes and earthquakes
- I have not ticked any box as I really did not find any course taken disagreeable or disliked any one of them
- I enjoy learning about new things and I was really surprised how much I did already know about the subjects, but you can never know too much or stop learning

- I found the course exciting
- I learned so much and I still want more
- I will be so sad now it has finished.
- It was an amazing opportunity - like a live TED video just for me each week
- The course has given me more confidence and made me understand and see the world and universe around me in a different light
- The feedback I received each week was like receiving a prize - I've never felt like this and it means so much to me.
- Thank you Phil for your energy and guidance and for teaching us and making us feel human
- 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
- Thank you
- Really difficult to pick a best liked I wanted to tick all of them.
- Sleep is something I personally have repeated lessons in due to being a pathways mentor and one of the sessions during this course is on sleep and its benefits
- The guest speaker inspired me to write a story (I haven't yet but now have the bare bones for one)
- I want to write sci-fi/fantasy so the whole course will be useful
- I did not dislike any of the weeks
- I enjoyed every single week even the ones I originally wasn't interested in.
- I would do all the weeks all over again
- 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
- The teacher kept the class engrossed in each topic with good discussions and took good feedback from each class
- I personally think the course isn't long enough. Plus, it should have been at least twice a week.
- Phil should continue to do things like this in the future. It brings positivity to such a negative place and I myself am more than grateful for him taking his time out to participate in such a project. Thank you.
- Phil was excellent and really kept us wanting more
- I found it enjoyable
- Suggestion: formation of a science book club, so that the students meet to discuss scientific articles and books
- Suggestion: a level 2 class as a follow up
- Thank you, Dr Phil
- Two days a week please
- The course was very interesting with excellent discussions and group chats.
- The teacher kept good control of the class and was very knowledgeable in all aspects of the science class.

- It gave me good insight into topics I was not very knowledgeable and learnt me things I only slightly understood
- It gave me a better understanding of how small we are in out place in the life cycle and universe
- Phil brought the right balance of seriousness and 'attempted' humour. Haha.
- Thanks for making me think even more like a scientist.
- Maybe next time a trip to the 'science and industry' museum would make the class even better! Haha
- Keep up the good work Phil
- More people need to experience this course
- After learning that the lessons that I did miss were very enjoyable I am sad that I missed them
- Thank you, Dr Phil
- I am now paranoid about my sleep
- Thank you for your time
- Looking forward to the next course!
- Definitely should have more of these classes or make it into a proper course
- Sign me up for the next course
- Sign me up for the next one please

Based on student feedback, the most enjoyable class was: Week 5: The Universe (10 votes).
Based on student feedback, the least enjoyable class was: Week 2: The Atmosphere (4 votes) and Week 1: Sleep (4 votes).

Feedback from an officer who witnessed one of the sessions: Phil's sessions were both entertaining yet educational. He is to be commended on the level of engagement with the subject and the [students]! I would have liked to have seen more of the sessions. This was great for the [students], different and very enjoyable.

N=20
Rate the statement as it relates to you:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. "The class increased my interest in science"	55%	40%	5%	--	--
2. "The instructor was knowledgeable of the subject being taught"	65%	30%	5%	--	--
3. "The instructor was enthusiastic about the subject"	80%	20%	--	--	--
4. "The class has encouraged me to think for myself"	50%	15%	35%	--	--
5. "The instructor was clear in presenting the material"	70%	30%	--	--	--
6. "The instructor was receptive to questions and/or discussions during class"	80%	20%	--	--	--
7. "The course overall was interesting"	70%	30%	--	--	--
8. "I would take this course again"	85%	15%	--	--	--
9. "The after-class work was set at the right education level"	55%	35%	10%	--	--
10. "I learned a lot during the course"	55%	35%	10%	--	--
11. "I found this course too difficult"	--	7%	7%	43%	43%
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

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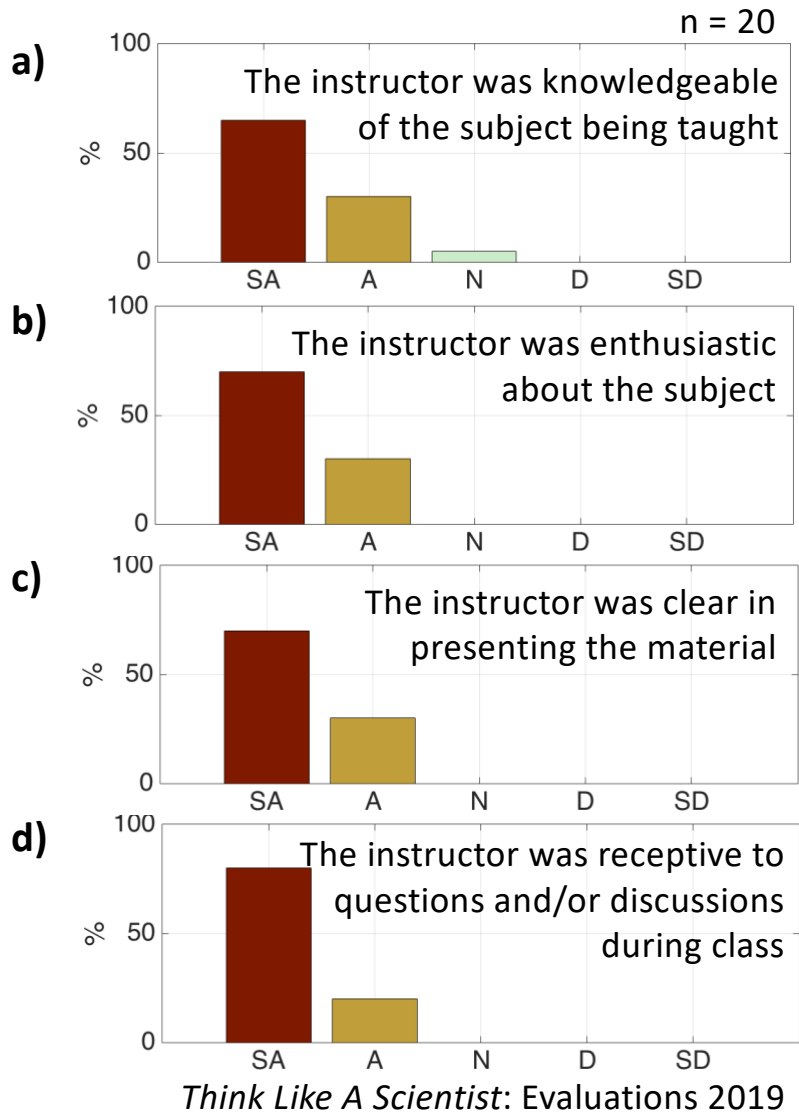
Figure 1: Student evaluations on instructor
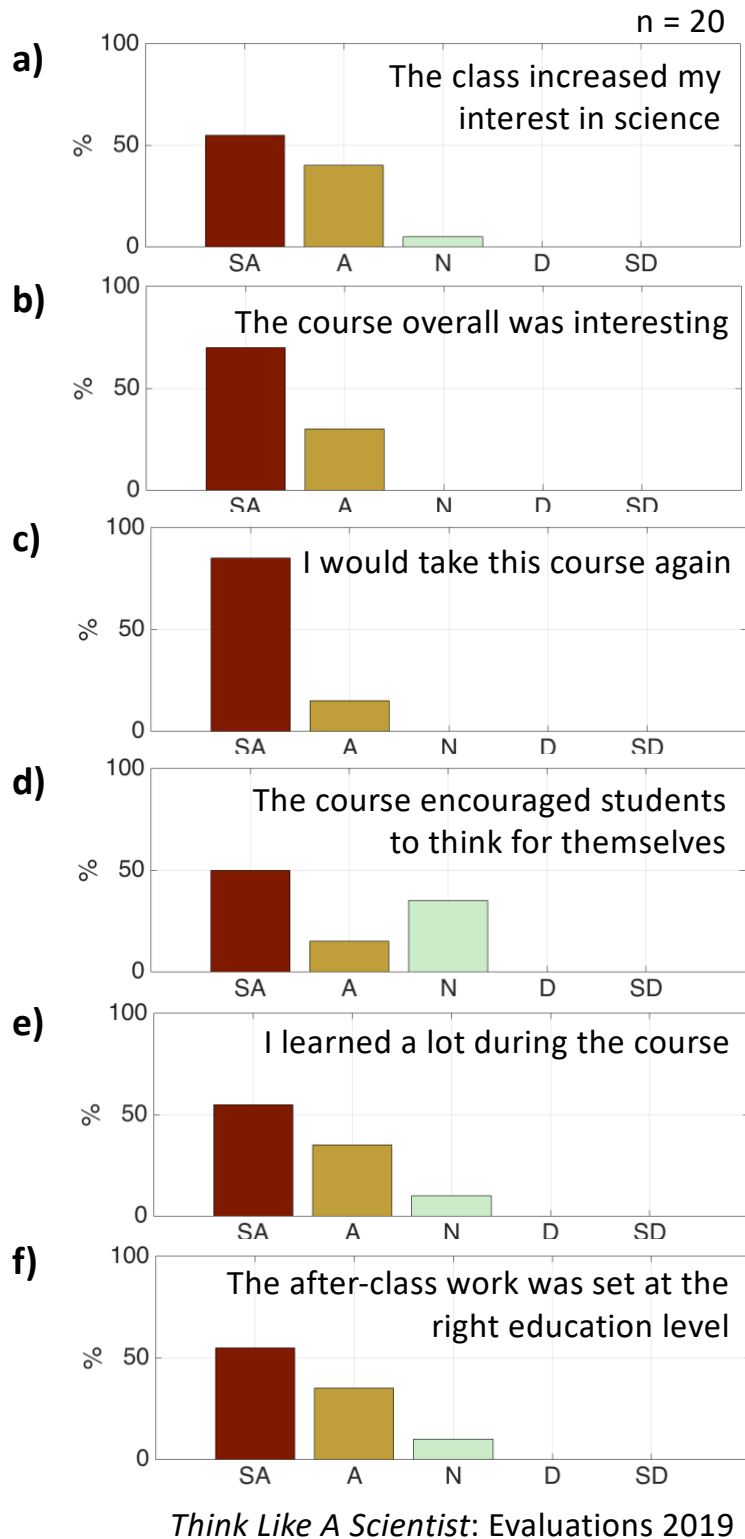
Figure 2: Student evaluations on course.
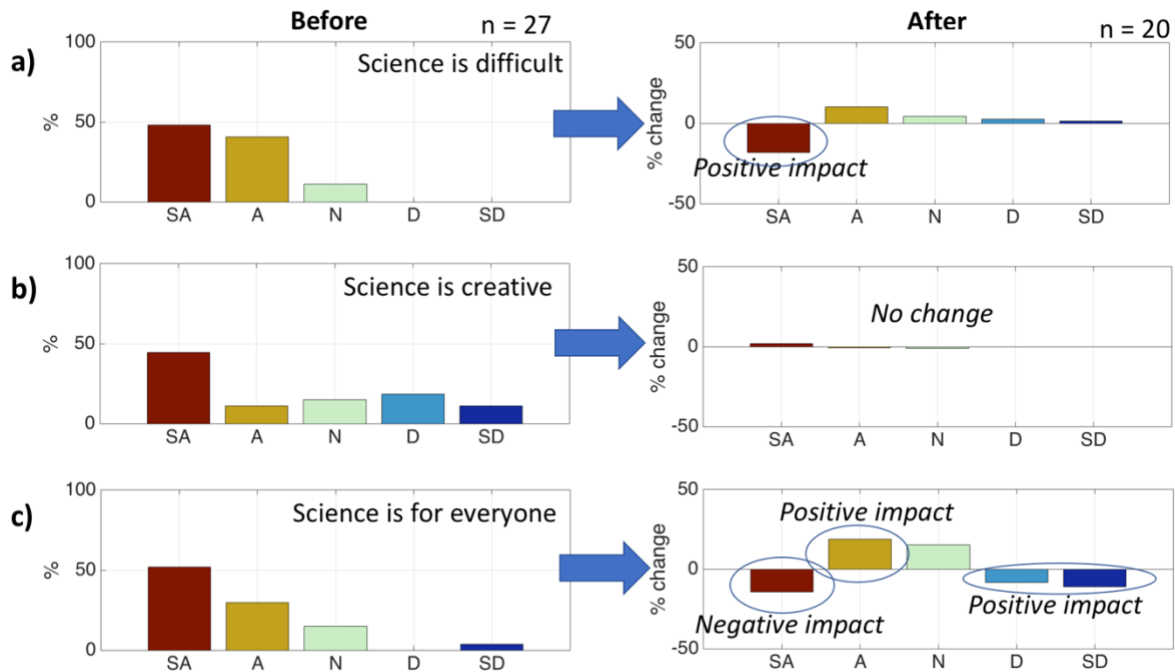
Figure 3: Student change in perception of science after taking the course.
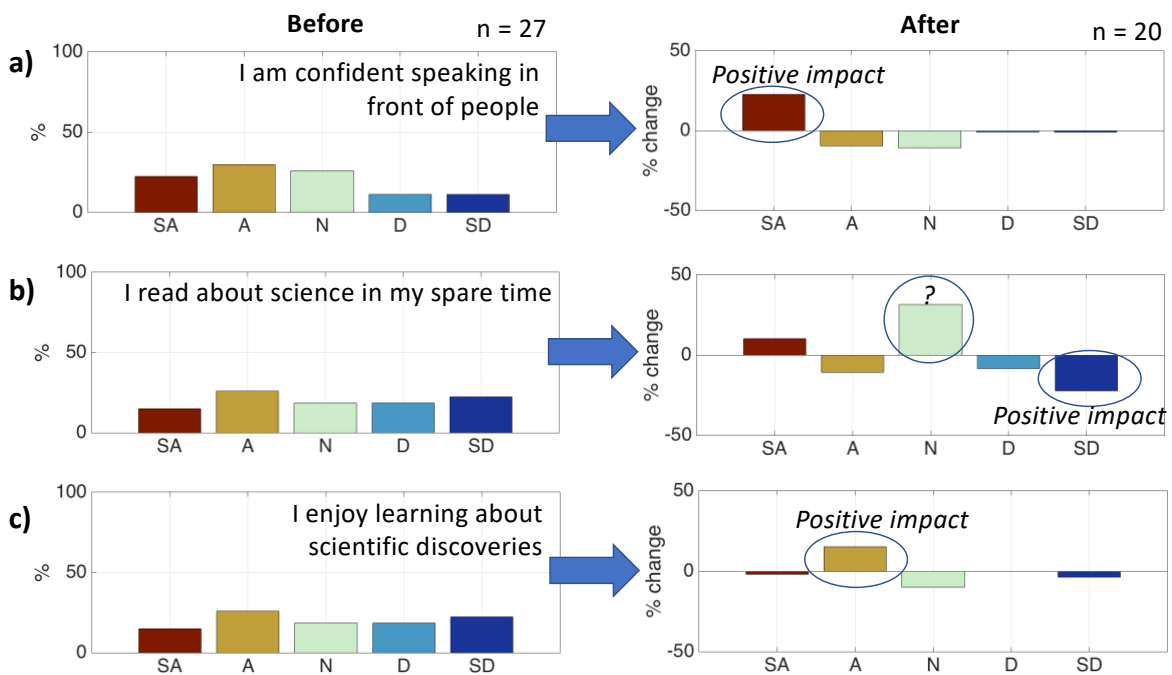
Figure 4: Student change in perception of themselves after taking the course.