

# How to bridge the gap that university teaching staff face when it comes to sustainable chemistry education?

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## Abstract

- The research aim is to investigate how to **bridge the gap** that university **teaching staff face** when it comes to **sustainable chemistry education**.
- Existing data shows that in schools there is a gap when it comes to what chemistry teachers feel comfortable teaching and what students expect to learn when it comes to sustainability<sup>1</sup>.
- The poster will present the outcomes of similar **data** that has **been gathered and shared from** the thoughts of Imperial College London **undergraduate students in chemistry**.
- This data has been **collected via a survey** that was distributed to students in all years.

## Methods

- Survey was created using **Qualtrics**.
- Questions fell under three different sections opinions on: 1) **climate action and sustainability**, 2) students' **current curriculum**, 3) **sense of agency** within students' degree course
- Survey was sent out to all undergraduate students at Imperial's Chemistry Department.
- The **data presented** here is considering a **total of 62 responses** including incomplete submissions.
- Ethics approval was achieved through the College and the survey was sent out at the end of the summer term and will be closing soon.

## Results and Discussion

"I've seen options in later years, but as a first year I don't see any sustainable chemistry at all, would be interesting to see more of if possible"- Y1 student

"Working on start-ups to see and promote sustainability initiatives"- Y4 student

### Students' Appreciations of and Suggestions on Sustainability in their Undergraduate Course

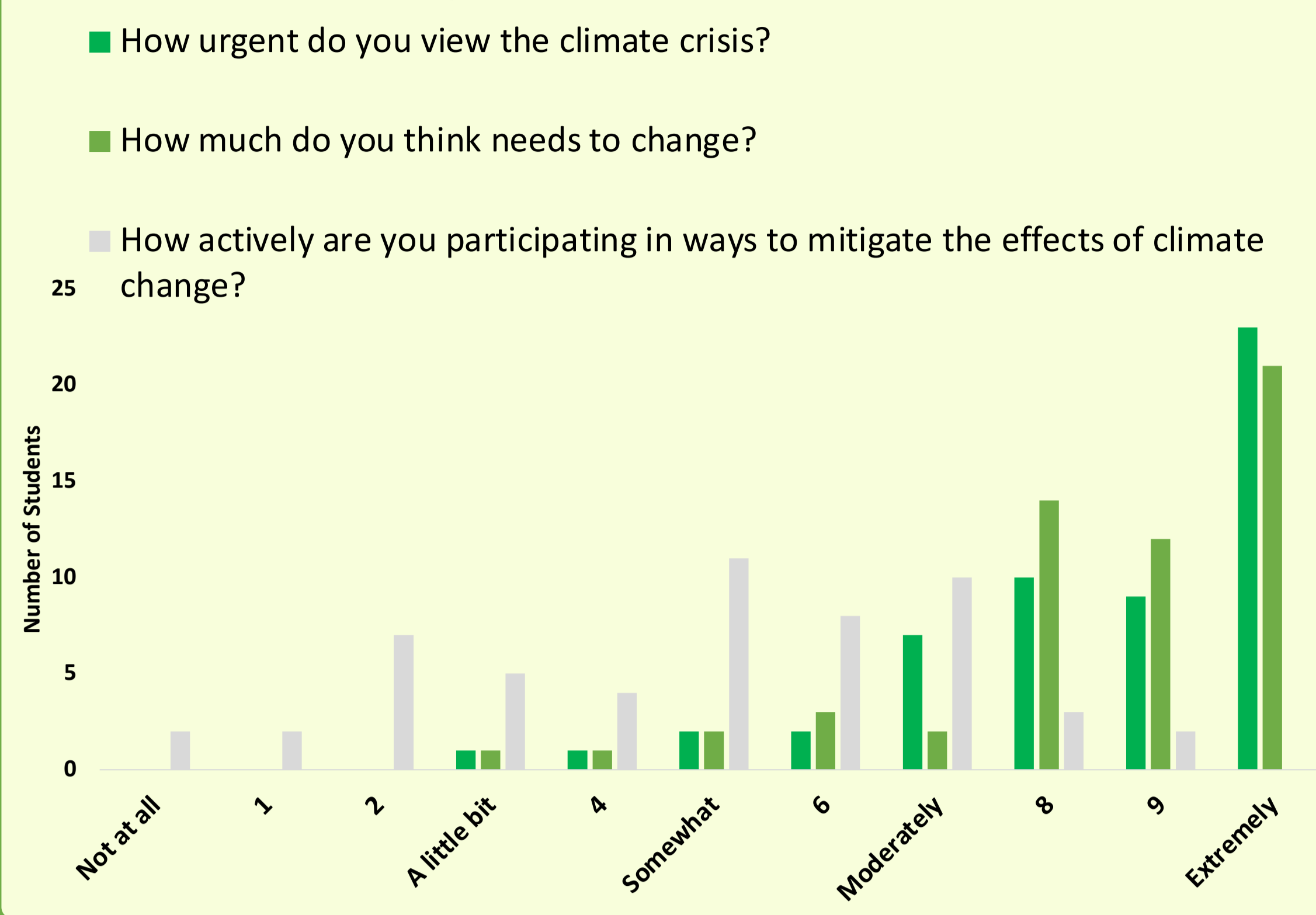
- Generally, a good number of students (around 40% of respondents) have taken the time to answer most free text questions.
- When asked **where they have seen sustainability being taught in the curriculum**, most students pointed out the same areas: **1<sup>st</sup> year labs, Macromolecules and Materials** core module in 2<sup>nd</sup> year and **Sustainable Chemistry** elective module in 4<sup>th</sup> year.
- An interest in **increasing sustainability content in organic and catalysis lectures** was expressed by a few students (20% of free text responders).
- Students had a **wide array of suggestions** of new activities or new content they would be keen on learning about that shows the **breadths of different interests**.

"The current curriculum focuses heavily on developed nations but the methods are not usually available to less developed countries." – Y2 student

"I would like to know more about the costing and the process of ordering chemicals, equipment etc."-Y3 student

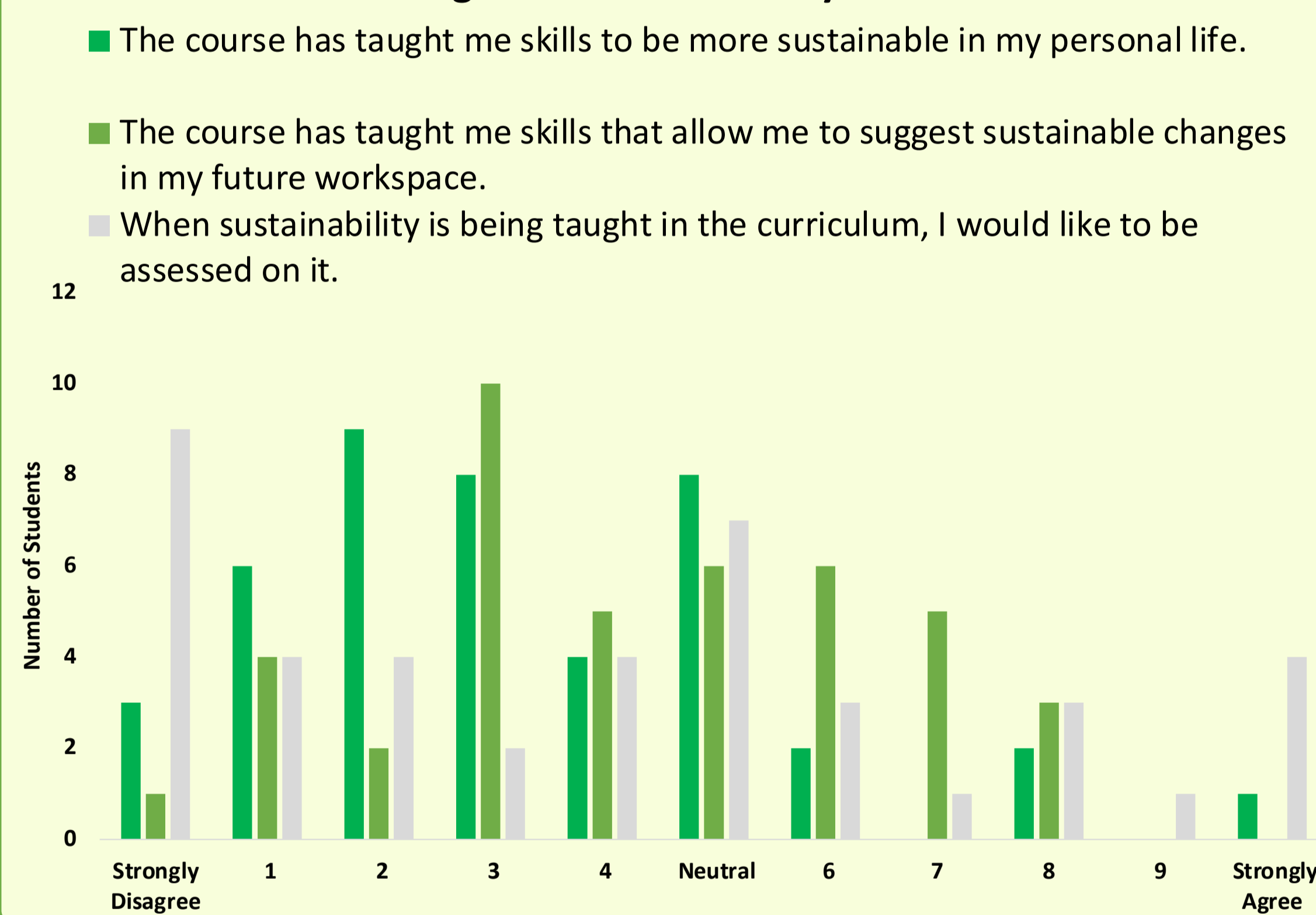
"New research that enhances sustainability, such as organocatalysis and in-water reactions" –Y1 student

### Students' Opinions on Climate Action in General



- **88%** of the students believe that the **climate crisis is urgent** and that there is a **lot that needs to change**. (Including answers in range: moderately to extremely.)
- Most students however **do not engage very actively to mitigate** the crisis, with **57%** participating from **somewhat to not at all**.

### Students' Thoughts on Sustainability in the Curriculum



- **88%** of students have **not shown any agreement** that the **course has taught them skills with regards to being more sustainable**
- **67%** feel that **same way about being taught skills to suggest sustainable changes** in the workplace.
- In terms of assessment, a fair number of students (**40%**) **strongly oppose** the idea of **being marked on the sustainability content** being taught whereas a few (**14%**) are **strongly in favour**.

## Conclusion and Future Work

- The overall understanding from looking at the data that we have from this survey, is that **students do see potential** (and the importance) to have **more sustainability** involved and included **into the curriculum**.
- Students have also **picked up on areas where this is already being mentioned** or implemented to some extent, mostly within the **practical chemistry teaching** and **relatively few lecture-based modules**.
- This research has allowed to have a **clearer idea** on what **students' expectations and hopes are, defining the "gap"** at Imperial Chemistry's department.
- The **next step** (which is currently underway) is **staff interviews and survey to understand the other side of the "gap"** and the barriers to bridging it.

## References

1. Green shoots: A sustainable chemistry curriculum for a sustainable planet. Royal Society of Chemistry n.d. <https://www.rsc.org/policy-evidence-campaigns/environmental-sustainability/sustainability-reports-surveys-and-campaigns/a-sustainable-chemistry-curriculum>