

**TROP ICSU: Trans-disciplinary Research Oriented Pedagogy for  
Improving Climate Studies and Understanding  
(<https://tropicsu.org>)**

**Report on the TROP ICSU Workshop for Teachers at Melbourne, Australia**

**organized in collaboration with**

**Monash University, Australia  
(24 May 2019)**

<b>Workshop Title:</b>	Workshop on CLIMATE CHANGE IN THE CLASSROOM
<b>Date:</b>	May 24, 2019
<b>Venue:</b>	Royal Society of Victoria, Melbourne, Australia
<b>Facilitators from the TROP ICSU Team:</b>	Dr. Rahul Chopra, Ms. Anita Nagarajan
<b>Facilitators and Organizing Team from Monash University:</b>	Dr. James Driscoll, Dr. Christian Jakob, Dr. Ailie Gallant
<b>Number of Participants:</b>	49
<b>Disciplines/Subjects Taught by Participants:</b>	Environmental Science; Ethics and Morality; Geography; Humanities; Mathematics; Philosophy; Physics; Psychology; Science

A detailed listing of the disciplines is provided in [Appendix I: Disciplines/Subjects Taught by the Participants](#).

## Contents

Summary of the Workshop .....	3
Details of the Workshop .....	6
Agenda and Overall Organization .....	6
Participant Feedback and Suggestions on Existing Teaching Resources .....	8
Key Takeaways and Learnings from the Workshop .....	8
Next Steps .....	9
<b>Appendix I: Disciplines/Subjects Taught by the Participants .....</b>	<b>10</b>
<b>Appendix II: Review of Lesson Plans by Participants.....</b>	<b>11</b>
<b>Appendix III: Review of Teaching Tools by Participants .....</b>	<b>14</b>

## Summary of the Workshop

A **1-day professional development workshop for high school teachers** was conducted in collaboration with Monash University at the Royal Society of Victoria, Melbourne, Australia on May 24, 2019. The workshop was attended by 49 participants teaching various disciplines.

TROP ICSU is grateful for the valuable support from Monash University in planning and organizing the workshop.

The objective of the workshop was *to introduce the participants to digital teaching resources for teaching topics in the Sciences, Mathematics, Social Sciences, and Humanities using climate-related examples, case studies, and activities*. In addition, participants would be invited *to review the educational resources of the TROP ICSU project and to provide their feedback on the appropriateness and ease-of-use of the teaching tools and lesson plans*. A few talks and presentations on climate science and climate change in the Australian context were also on the agenda.



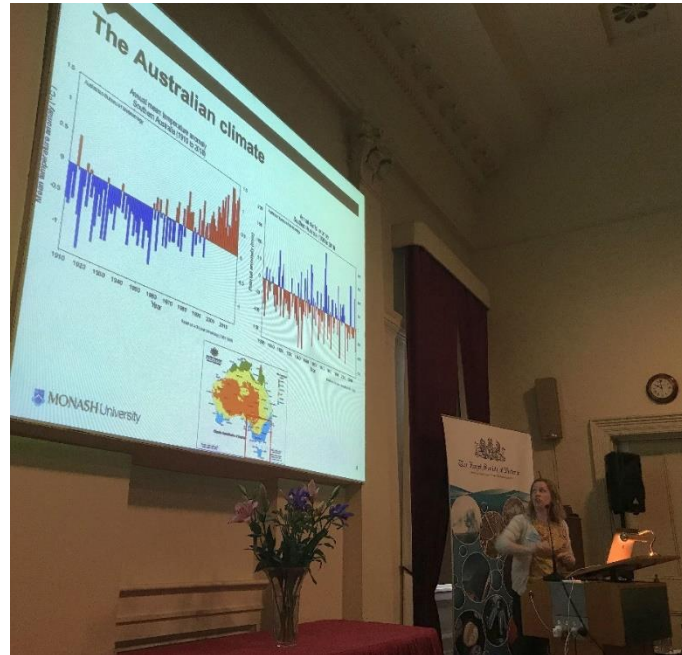
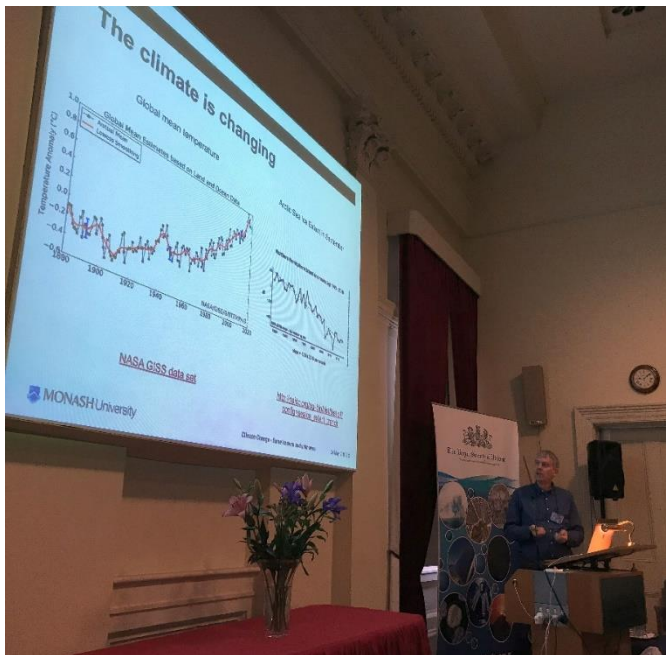
Group Photo: Workshop for Teachers, Melbourne, Australia

The workshop commenced with welcome remarks on behalf of Monash University and the TROP ICSU team. The participants were mainly high school level teachers of various subjects/disciplines from educational institutions and organizations in Victoria. The workshop included presentations by climate experts Christian Jakob and Ailie Gallant from Monash University, and a brief talk by Prof. John Buckeridge from RMIT and the Australian Academy of Science. The TROP ICSU team provided an [overview of the TROP ICSU project](#) and its educational resources, including teaching tools and lesson plans. The team from Monash University also demonstrated the [Monash Simple Climate Model](#). In the second half of the day, the teachers/educators worked in groups to carry out hands-on, interactive activities by using various [teaching tools](#) and [lesson plans](#) from the TROP ICSU website. They reviewed the teaching resources from the pedagogical and ease-of-use perspectives and provided feedback (via online review forms) to help in further enhancing the quality and effectiveness of the content. In these

activities, participants engaged in peer-to-peer discussions and exchanged ideas for effective teaching using relevant examples.

*Christian Jakob provided a wonderful fun element to the workshop through the “Molecule Vibration” dance, which had the entire audience on their feet, pretending to be CO<sub>2</sub> and CH<sub>4</sub> molecules!*

*A students' Climate Strike near the workshop venue on the same day stole everyone's attention for a few moments, reinforcing the need for urgent climate action.*



Plenary Sessions at the Workshop for Teachers, Melbourne, Australia



Plenary Session at the Workshop for Teachers, Melbourne, Australia

Overall, the participants were keen on exploring ways to integrate climate science/climate change-related topics in their existing curriculum. They provided critical feedback on the existing teaching resources from the pedagogy and discipline perspective.



Group Activity at the Workshop for Teachers, Melbourne, Australia

Summary of the feedback received on the lesson plans from the TROP ICSU website

**Explaining the topic(s) in the discipline:** 100% of the responses from the participants stated that the reviewed lesson plan was **very effective or moderately effective** in explaining the topic in the discipline.

**Integrating the discipline topic(s) with climate science:** Approximately **83%** of the responses from the participants indicated that the reviewed lesson plan was **very effective or moderately effective** in integrating the discipline topic(s) with climate science.

**Using the lesson plan in the classroom:** Approximately **83%** of the responses from the participants indicated that they **would use the lesson plan in their classroom as is or with some modifications**.

Detailed results for the lesson plan reviews are provided in [Appendix II: Review of Lesson Plans by Participants](#).

Summary of the feedback received on the teaching tools curated on the TROP ICSU website

**Explaining the topic(s) in the discipline:** Approximately **54%** of the respondents thought that the reviewed tool was **very effective or moderately effective** in explaining the topic(s) in the discipline.

**Describing the tool:** Approximately **46%** of the responses stated that the **tool description adequately shows how the discipline topic can be taught using a climate-related example, activity, or case study**.

**Using the tool in the classroom:** Approximately **69%** of the respondents indicated that they **would use the reviewed tool in their classroom as is or with some modifications**.

Detailed results for the teaching tool reviews are provided in [Appendix III: Review of Teaching Tools by Participants](#).

## Details of the Workshop

### Agenda and Overall Organization

The agenda of the one-day workshop was as follows:

Welcome remarks from Monash University and TROP ICSU: Welcome and Objectives of the workshop

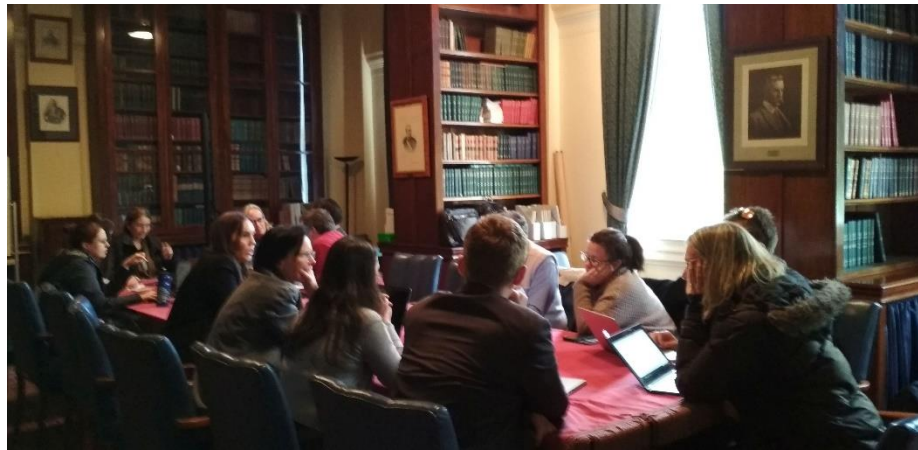
Presentations by climate experts from Monash University: “Climate Change Knowns and Unknowns” by Christian Jakob, Monash University; “Australian Climate and Climate Change” and “Mythbusters: The top bad arguments about climate change under the microscope” by Ailie Gallant, Monash University

Presentations by the TROP ICSU team: Welcome remarks; introduction to the TROP ICSU project, overview and demonstration of teaching resources (teaching tools and lesson plans) by using examples from each discipline

Group-based activity by the participants (groups organized by discipline): Review of discipline-specific teaching resources available on the TROP ICSU website (one lesson plan and one teaching tool per group); providing feedback on teaching resources through online review forms

Discussions on the review of teaching resources, overall feedback on the workshop, discussion on long-term engagement of participants with TROP ICSU

Closing remarks



Group Activity at the Workshop for Teachers, Melbourne, Australia



Group Activity at the Workshop for Teachers, Melbourne, Australia



Climate Strike by Students in Melbourne, Australia

### Participant Feedback and Suggestions on Existing Teaching Resources

- One of the lesson plans in the Environmental Sciences assumes considerable background understanding of Chemistry. The lesson plan may, therefore, be inaccessible to Environmental Science teachers/students who do not have this prerequisite training.
- Scaffold higher-order thinking questions
- Add links to local policy

### Key Takeaways and Learnings from the Workshop

- From observations during the workshop, the key learning for many teachers was: the idea of using and creating teaching resources that integrate topics in climate science or climate change with topics in their discipline.
- Some participants found the presentations from climate experts to be useful and relevant, while other participants thought they already had a good understanding of the background/theory of climate change.
- Some participants indicated that they would have preferred to explore the TROP ICSU resources as a pre-workshop activity and then, discuss these in more detail during the workshop. They were also keen on developing new resources (an activity typically included in a 2-day workshop, but not part of a 1-day workshop)



- Participants sought contextually relevant examples (Australia) for their teaching; they suggested the inclusion of more simulations and examples relevant to or customized for Australia.
- One suggestion was to include discussions on climate change-related methods and resources that participants in the workshop are already implementing and using in the classroom.
- Some feedback from participants:

*"Excellent resource modify to Australian conditions"*

*"Would be useful to incorporate some local examples using the interactive models to see impacts of sea level rise."*

*"Place the additional resources in the lesson and ensure they are available to students through the activity section."*

*"Spend more time having teachers research the tools and work to create more for you..."*

*"The morning sessions were a highlight - hearing about the latest climate change science and getting the details about the TROP ICSU resources. I was impressed with the philosophy of helping teachers integrate climate change issues into the standard curriculum. Having reliable resources to do this makes the objective achievable. Reviewing a teaching tool and detailed lesson plan was also a useful exercise as it helped me delve deeper into the resources..."*

## Next Steps

- Modification of existing teaching resources (content and layout) based on analysis of feedback from participants
- Addition of new resources or enhancing existing resources to include Australia-specific examples, cases studies, and activities

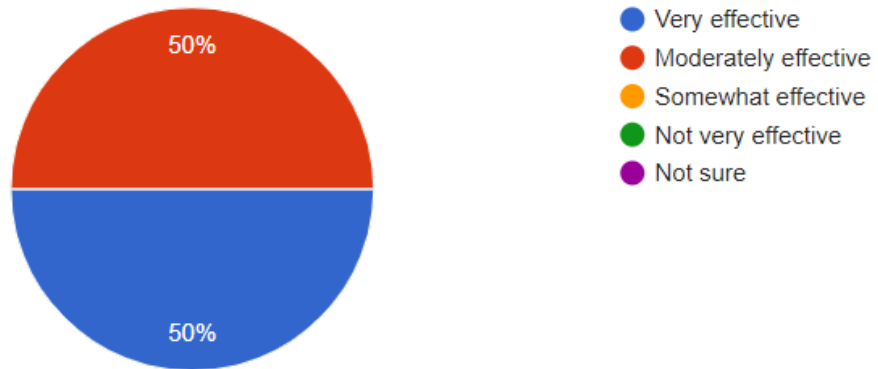
*Appendix I: Disciplines/Subjects Taught by the Participants*

Environmental Education; Environmental Science; Ethics and Morality; General Science; Geography; Global Studies; Humanities; Mathematics; Philosophy; Physics; Psychology; Science; STEM

Appendix II: *Review of Lesson Plans by Participants*

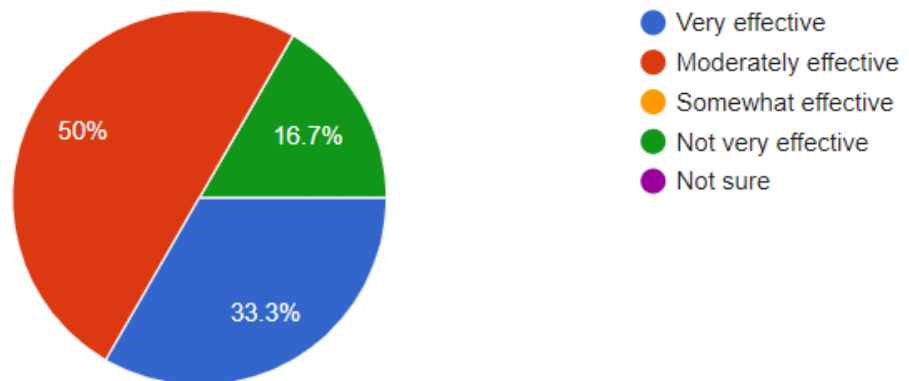
2. In your opinion, how effective is this lesson plan in explaining the topic(s) in the discipline?

6 responses



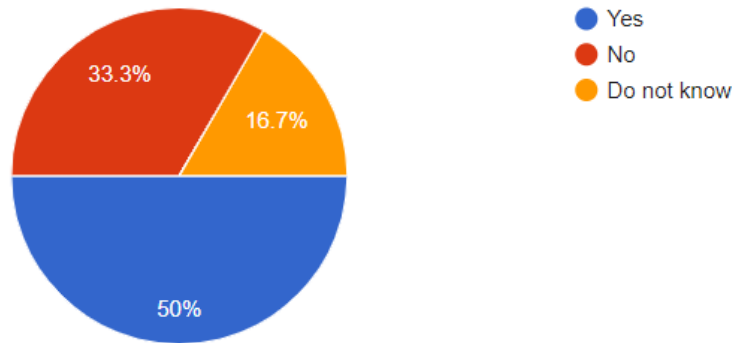
3. In your opinion, how effective is this lesson plan in integrating the discipline topic(s) with climate science?

6 responses



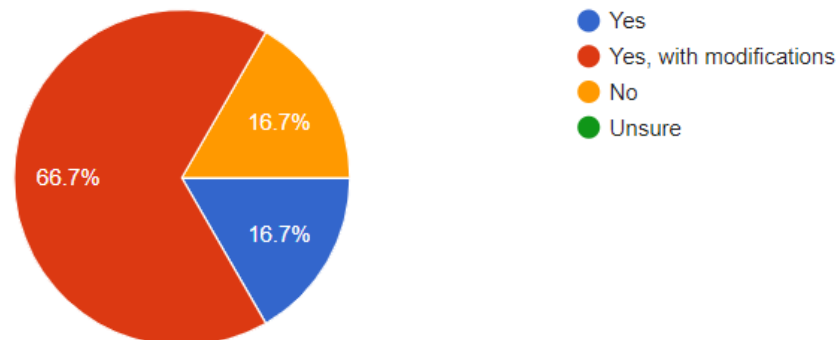
7. Do you think that your students will become more aware of climate change if you use this lesson plan in your classroom?

6 responses



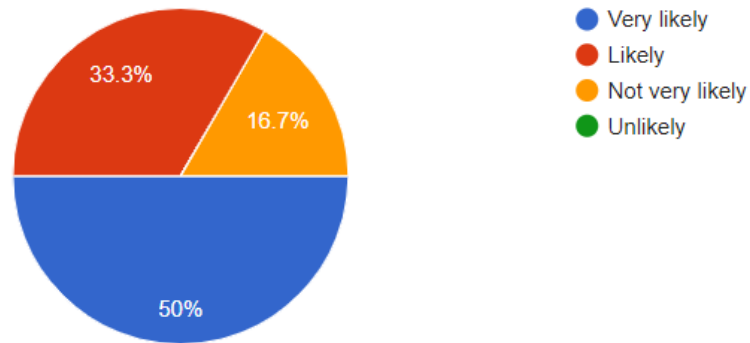
8. Would you use this lesson plan in your classroom for your students?

6 responses



10. How likely are you to develop your own lesson plan that can enhance the understanding of a core topic in your discipline using a climate-related example, activity, or case study?

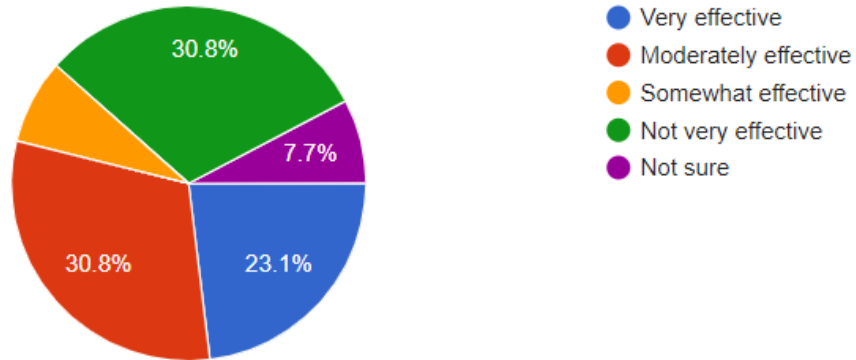
6 responses



Appendix III: *Review of Teaching Tools by Participants*

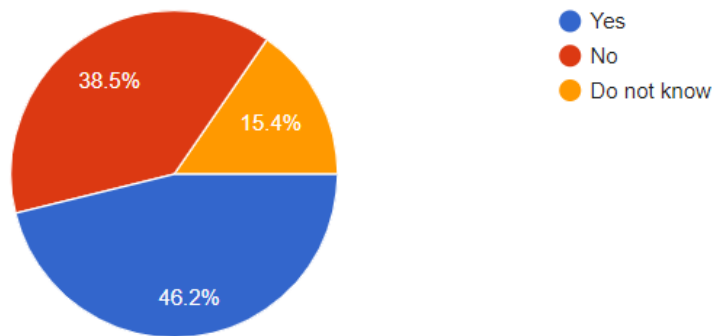
2. In your opinion, how effective is this teaching tool in explaining the topic(s) in the discipline?

13 responses



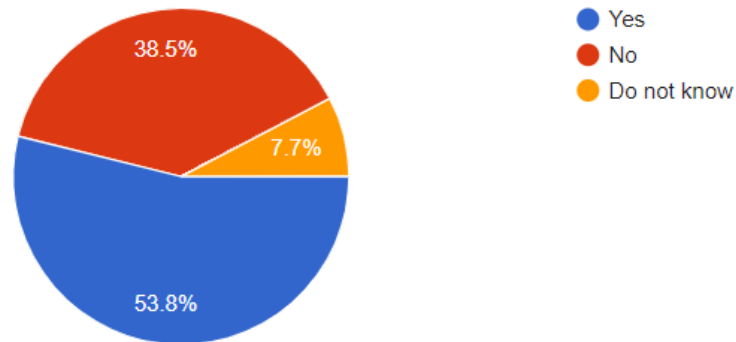
4. Does the tool description adequately show how the discipline topic can be taught using a climate-related example, activity, or case study?

13 responses



5. Do you think that your students will become more aware of climate change if you use this teaching tool in your classroom?

13 responses



6. Would you use this teaching tool in your classroom for your students?

13 responses

