

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 Bengaluru, India
organised in collaboration with

The National Centre for Biological Sciences (NCBS), Bengaluru

Workshop Title: Faculty Development Program cum Workshop
CLIMATE CHANGE IN YOUR CLASSROOM: A
WORKSHOP FOR TEACHERS OF ALL
DISCIPLINES

Date: May 2-3, 2024

Venue: National Centre for Biological Sciences (NCBS),
Bengaluru

Facilitators from TROP ICSU team: Dr. Rahul Chopra, Ms. Sanjana Singh, Mr. Sanchit Sant

Facilitating and Organising team from NCBS Bengaluru: Dr. Krithi Nandimath, Dr. Rajesh Ladher and Dr. L. S. Shashidhara

Number of participants: 68

Disciplines/Subjects taught by participants: Biological Sciences, Physics, Mathematics & Statistics, Chemistry, Media Studies, Environmental Sciences, Humanities, etc.

A detailed listing of the disciplines is provided in
[Annex I: Details of Participants](#)

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Summary of the Workshop

A **2-day faculty development program cum workshop for educators** from various disciplines teaching different grade levels was conducted in collaboration with National Centre for Biological Sciences (NCBS), Bengaluru on the 2nd and 3rd of May 2024.



Group Photo: Workshop for College Professors and School Teachers, NCBS, Bengaluru, India.

TROP ICSU is grateful for the tremendous support and help from NCBS, Bengaluru in planning and organizing the workshop.

In this workshop, participants learnt:

1. How to integrate climate change in their everyday teaching
2. How to use inter- and trans-disciplinary teaching resources in their classroom
3. Effective teaching strategies using digital teaching tools

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4. How to construct an effective lesson plan
5. To develop a lesson plan that integrates climate change with their current teaching

This workshop introduced the participants to digital teaching resources to teach topics in the Sciences, Mathematics, Social Sciences, and the Humanities disciplines using climate-related examples, case studies, and activities. In this interactive workshop, participants carried out several hands-on activities through the use of different types of digital teaching tools. Participants also developed their own lesson plan to use in their classroom to enhance the conceptual understanding of topics in different disciplines while increasing awareness of climate change.



Plenary sessions conducted by Dr. Rahul Chopra and Ms. Sanjana Singh at the workshop, NCBS Bengaluru, India

Day 1 Summary

The workshop commenced with Dr. L. S. Shashidhara, Director, NCBS Bengaluru, India, giving a welcome speech followed by a few words from Dr. Rajesh Ladher, Dean of Academics, NCBS

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Bengaluru, India, addressing the audience of undergraduate professors, graduate professors, PhD students, school teachers, and other educators teaching various disciplines across India. Then, Project TROP ICSU team provided an overview of the project along with lists of few resources and an in-depth walkthrough of lesson plan structure. This was followed by an introductory session on the ‘Science of Climate Change’ by Dr. Rahul Chopra, Project Director, TROP ICSU. Then, a platform walkthrough was conducted for the participants where they were exposed to all the resources available and the process of searching for Teaching Tools and Lesson Plans. The day concluded with two activities completed by the participants where they reviewed a teaching tool and a Lesson plan of their interest and discussed their findings.

Day 2 Summary



Group and Individual activities during the workshop, NCBS bengaluru, India

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The second day began with a group or individual activity of writing a Lesson Plan. This activity was a carry forward from the previous day of reviewing a Lesson Plan. During the previous day discussion, many educators voiced the need to create more introductory resources for their particular syllabus. This led to them finding the right resources and creating a Lesson Plan that they can use in their classroom. During this activity most participants teamed with others from the same discipline or institutes and together created content that they would like to use in their classrooms. The session ended with all participants presenting their work and an open discussion on topics such as climate positivity, inclusive educational resources, policy change, amongst others.



Participant presentation of Lesson Plans at the workshop, NCBS Bengaluru, India

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Expert Meeting Summary

On the second day, after participant presentation and discussion, there was an expert panel discussion along with a Q&A session. The expert panel consisted of local and subject experts from [NCBS](#), [Azim Premji University](#), [ASAR Social Impact Advisors](#), [The Climate Educators Network](#), [Ashoka Trust for Research in Ecology and the Environment \(ATREE\)](#) organisation, and [Indian Institute of Science](#) amongst others



Expert plenary session during the workshop, NCBS Bengaluru, India

Details of Workshop

Schedule and Agenda

The schedule and agenda for Day 1 of the workshop is:

- Welcome remarks by NCBS
- Welcome remarks by Project TROP ICSU
- Introduction of each Participants
- An Introduction to Project TROP ICSU
- A Simple Introduction to the Science of Climate Change and Related Teaching Resources
- Demonstration of digital teaching tools that integrate climate topic with core disciplinary teaching
- Demonstration of step-by-step lesson plans that integrate climate topics with core disciplinary teaching

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- Activity 1: Review of discipline-specific teaching tools—their connectivity to the curricular topics and utility for the understanding of the concepts
- Activity 2: Review of discipline-specific lesson plans—their connectivity to the curricular topics and utility for the understanding of the concepts
- Discussions on participants’ review of teaching tools and lesson plans

The schedule and agenda for Day 2 of the workshop is:

- Introduction to the design components of a Lesson Plan
- Group activity: Design lesson plans that integrate climate topics with their regular teaching
- Group activity (continued): Design lesson plans that integrate climate topics with their regular teaching
- Presentations of lesson plans designed by the participants
- Presentations of lesson plans designed by the participant
- Open Discussion: Feedback on the workshop and teaching resources, and discussion on long-term engagement
- Invitation to attend a meeting of climate change and education experts from Bengaluru titled ‘**Climate Change Education: In Bengaluru and Beyond**’ with experts from NCBS, IISc, APU, ATREE and other institutes and organisations from Bengaluru.

Participant Feedbacks and Suggestions on Existing Teaching Resources

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

- **Explaining the topic(s) in the discipline: 84.3%** of the responses from the participants stated that the reviewed teaching tool was **very effective or moderately effective** in explaining the topic in the discipline.
- **Describing the tool: 90.2%** of the responses stated that the teaching tool **adequately integrates topic(s) in discipline with climate change.**
- **Using the teaching tool in the classroom: 96.1%** of the responses from the participants stated that **students will become more aware of Climate Change** through the use of the teaching tool. **39.2%** of participants stated that they would **use the tool directly in their classroom** whereas, **51% would use the teaching tool with modifications.**

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Detailed results for teaching tool reviews are provided in [Annex II: Review of Teaching Tools by Participants](#)

Summary of the feedback received on the Lesson Plans curated on the TROP ICSU website

- **Explaining the topic(s) in the discipline: 93%** 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: 88%** 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: 100%** of the responses from the participants indicated that they **would use the lesson plan in their classroom as is or with some modifications**. **95.3%** of the participants stated that students will become more aware of climate change through the use of the lesson plan.



Plenary sessions on second day of the workshop, NCBS Bengaluru, India

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Ideas for New Lesson Plans

Over 30 lesson plan ideas were submitted to the TROP ICSU team. There were some contextually and geographically relevant lesson plans while others were discipline-specific such as:

- Bengaluru city water bodies and aquifers role in city planning and urban expansion,
- IGCSE (Cambridge Board) English language lesson plan using climate related news reports,
- Calculating individual food mileage through a complete supply chain from agriculture to distribution and consumption,
- An introduction to impacts of climate change on trade and commerce
- Using Mangroves as carbon sinks through a case study of Belize
- Difference between clean and renewable energy and their impacts on climate change
- An immunology study of the impacts of climate change on human systems and health
- Impact of climate change on neurotransmission and its effects on individual mood and happiness index
- Introduction to media studies through photography of impact of climate change on biodiversity
- Climate change impacts on the breeding behaviour of frogs
- ‘Green Meat’ and its impacts on greenhouse gas emissions
- Study of oceanic history and use of oceans as a method for thinking about philosophy
- Science communication through the use of climate related visuals

Key Takeaways and Learnings from the Workshop

- Key Learning for team TROP ICSU: we learnt how the TROP ICSU platform is navigated by the users if a platform walkthrough is not given to them. We also understood how user friendly the website is and what pages need improvement.
- Key learning for the participants: they were introduced to how climate change can be integrated into their lesson plans and everyday teaching without needing to veer away from the topic in discipline.

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- Participants had limited knowledge about the science of climate change and hence having a session on what is natural and anthropogenic climate change was one of the most useful sessions for them.
- Participants found group activities to be the most effective interactive session.
- Peer discussions in groups helped in the exchange of ideas and enhanced participants' learning.
- College professors and school teachers were introduced to the method that TROP ICSU uses to create lesson plans on its platform
- Participants also searched for teaching tools to create their own lesson plans and familiarised themselves with scientific open-source databases other than journal articles.
- Key takeaway: Due to the interest shown and invitations received, establishing Bengaluru as one of the 'Hubs' for TROP ICSU workshops in India seems to be the next steps for the project.
- Some feedback from participants:
 - *"It was great to see so many people passionate about climate change and to witness collective efforts in the field"*
 - *"This workshop helped me how to integrate topics in climate change, greenhouse effect, global warming in my teaching and how to put this together to make a beautiful lesson plan in my discipline"*
 - *"We had a wonderful experience in the past two days and the TROP ICSU website has a lot of wonderful content, we were quite surprised."*
 - *"When we looked into the TROP ICSU website we were amazed by the plethora of resources. We are taking home a lot of knowledge, information and enthusiasm to talk about climate change and be the changemaker"*
 - *"I was very curious to see how climate change can be incorporated into economics or business, and it has been a wonderful journey in knowing how to do this and to hear from so many people from different disciplines and walks of life"*

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Next Steps

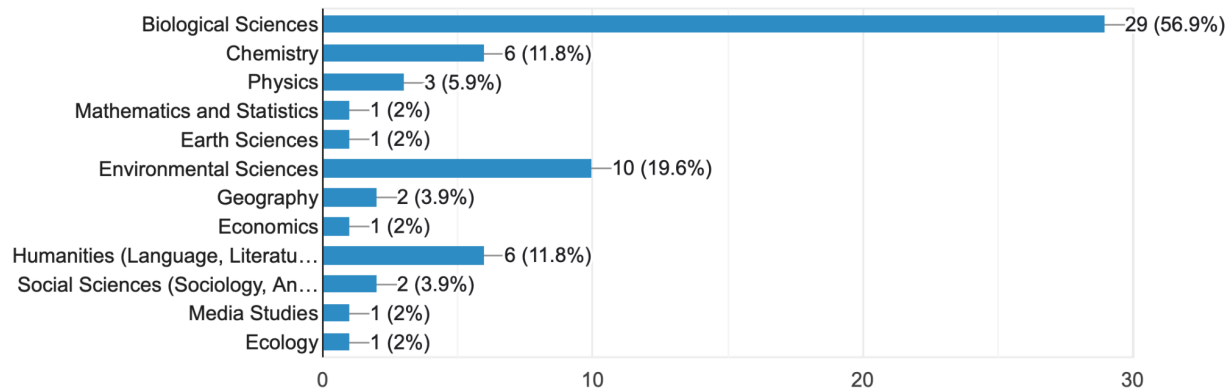
- Engagement by Team TROP ICSU with the participants to further enhance/refine the lesson plan ideas created during the workshop.
- Addition of more region specific and new discipline resources as per suggestions.
- Mapping of existing resources to Indian Education Boards and syllabi as per suggestion.
- Engagement of participants for a Level 2 workshop focusing on content creation.

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Annex I: Details of Participants

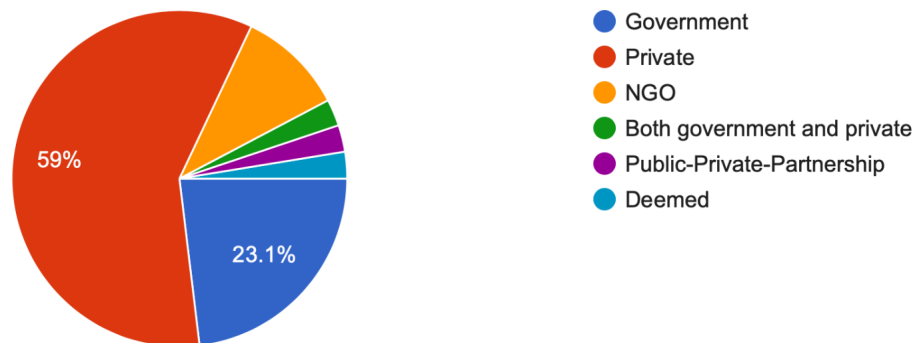
5. What is the main subject that you teach? Select the most relevant option

51 responses



6. What type of educational institution do you teach in?

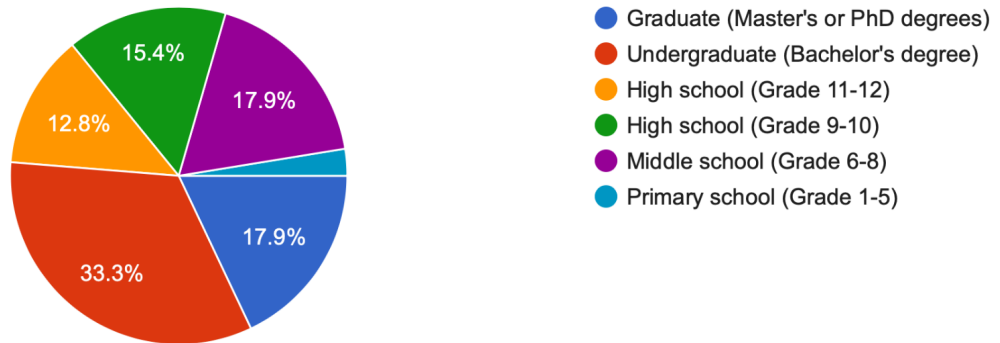
39 responses



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7. What grade level do you teach? Select the most relevant option

39 responses

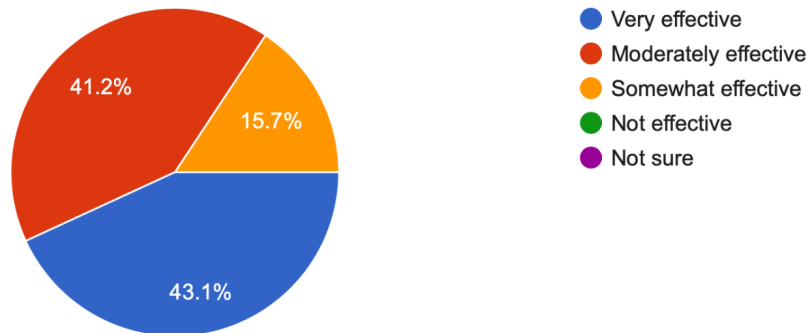


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Annex II: Review of Teaching Tools by Participants

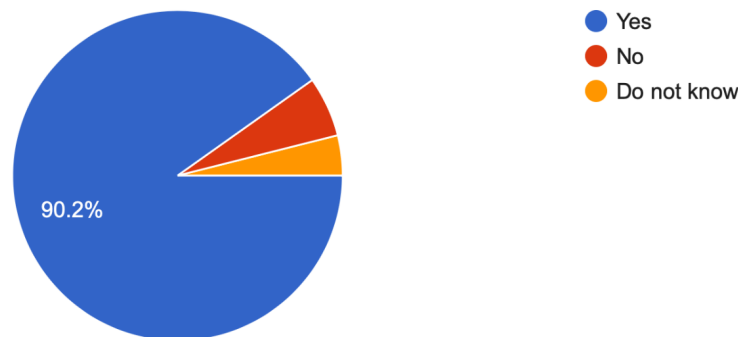
2. In your opinion, how effective is this teaching tool in explaining the topic(s) in the discipline?

51 responses



3. Does this teaching tool adequately integrate the topic in discipline with climate change?

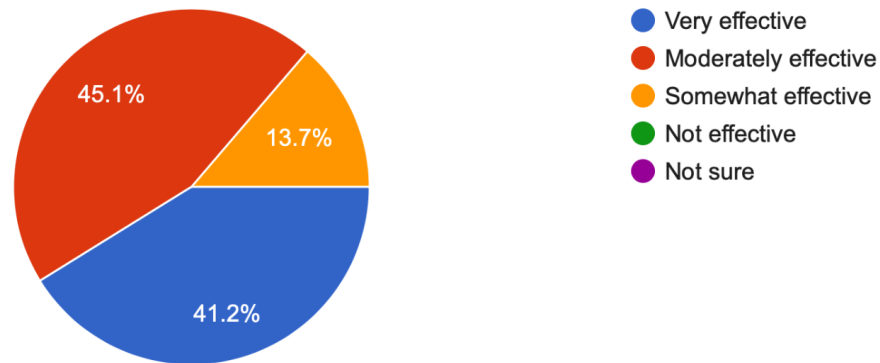
51 responses



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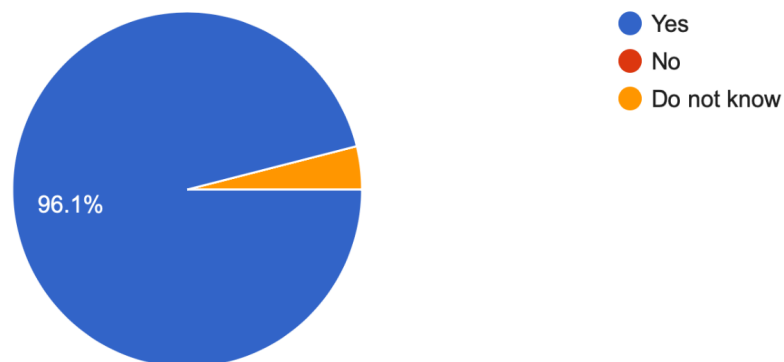
4. In your opinion, how effective is this teaching tool in explaining the climate topic?

51 responses



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

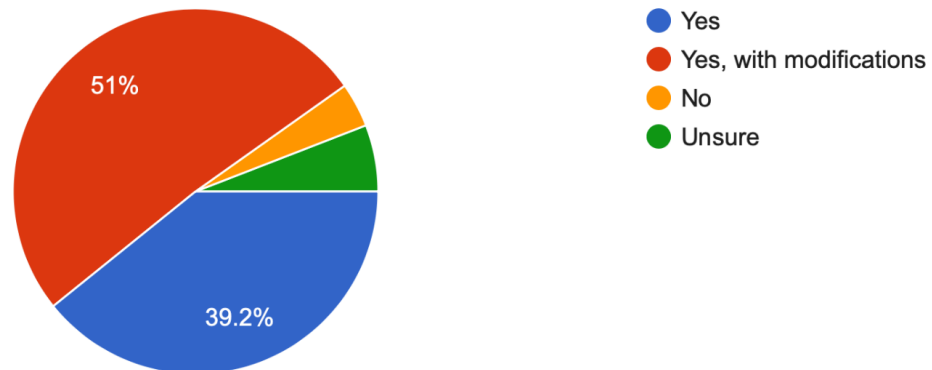
51 responses



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

51 responses

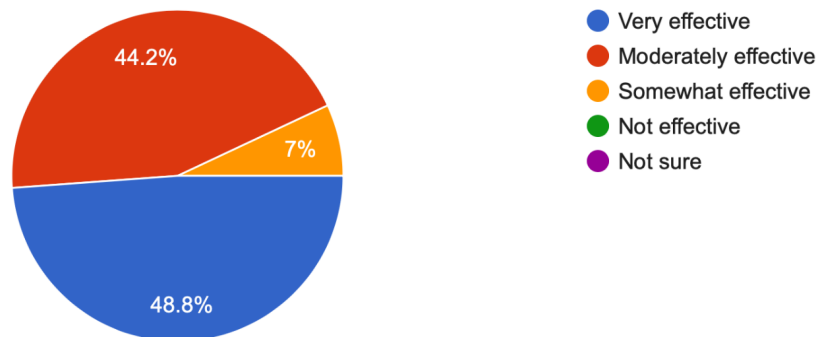


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Annex III: Review of Lesson Plans by Participants

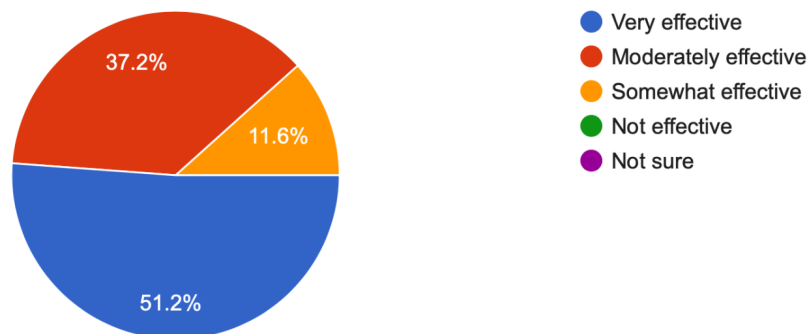
2. In your opinion, how effective is this lesson plan in explaining the topic(s) in the discipline?

43 responses



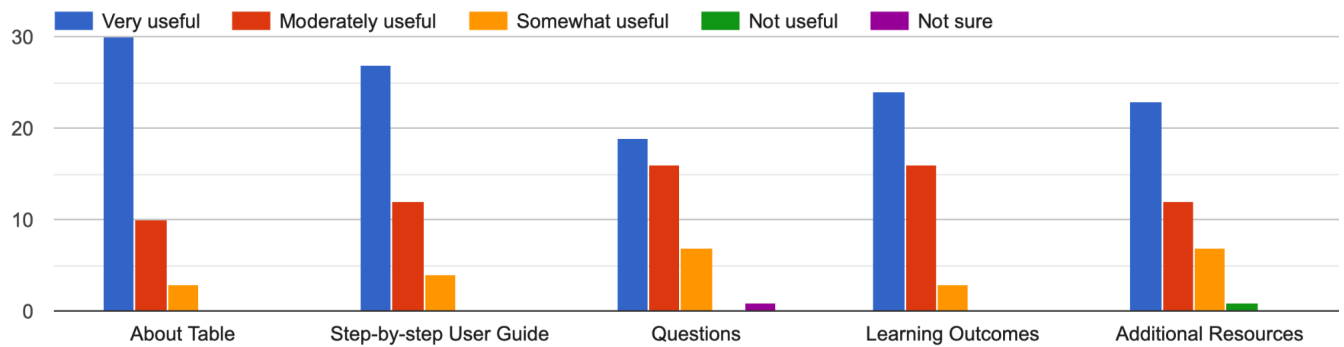
3. In your opinion, how effective is this lesson plan in integrating the discipline topic(s) with climate science?

43 responses



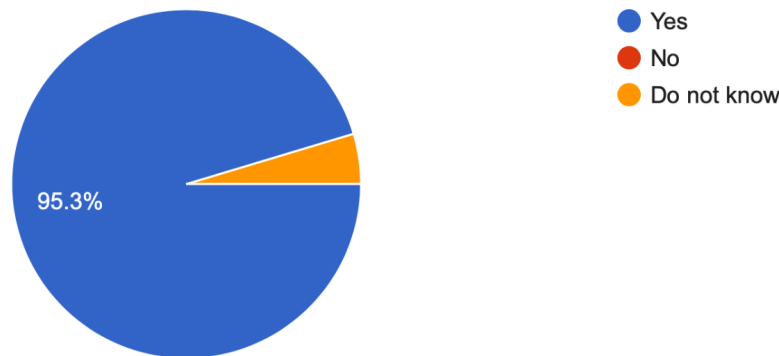
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5. The lesson plan contains a) Learning Outcomes b) About Table c) Step-by-step user guide d) Questions e) Additional resources. How useful did you find each component of the lesson plan?



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

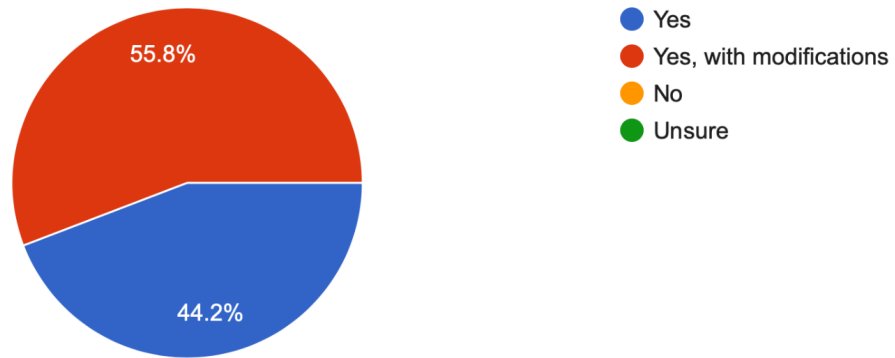
43 responses



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

43 responses



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