An introduction to climate change in management education: an individual-level approach

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Abstract

Purpose – This study aims to introduce management students to climate change by providing them with an opportunity to address it in their own lives, through a class exercise.

Design/methodology/approach – An in-class exercise was designed, carried out and described in this study. Student teams were assigned different questions on how to address major causes of climate change. Each team did research to generate answers, and ranked their answers based on the speed of implementation. Teams reported their answers to the class. The instructor facilitated a debriefing session, during which all responses were ranked with respect to other variables, including cost savings, time savings and lifestyle fit. This exercise uses few resources and can be adapted to different time lengths and teaching/learning formats (e.g. on-ground, virtual, asynchronous online).

Findings – This exercise can help students to gain an understanding of climate change and its causes and complexities. Students learn how to implement a diverse set of personal actions to mitigate climate change; these can start in the present and continue throughout their lives. In addition, this exercise may help students to make the leap from individual climate change mitigation practices to organizational and societal practices, when they are in the position to do so as future leaders.

Originality/value – Although classes, exercises, and assignments ask management students to consider issues such as climate change at the organizational level, this individual-level exercise can allow students with limited organizational experience to engage more quickly with climate change and better understand organizational and societal implications in the future. That is, if students first understand how to address climate change in their own lives, they may more effectively transfer and apply that understanding at organizational and societal levels and ultimately synthesize solutions to address climate change in the world.

Keywords Management education, Experiential exercise, Climate change, Carbon literacy

Paper type Conceptual paper

Introduction and justification

Climate change is a unifying issue for research and practice across disciplines, and a major challenge in our world. Combatting climate change is one of the United Nations Sustainable Development Goals (UN SDGs – climate action) and is implicit in the UN Principles for Responsible Management Education (PRME). Therefore, an understanding of climate change and how to address it is vital in management education. This experiential exercise introduces students to climate change by giving them an opportunity to address it in their own lives. While we frequently ask management students to consider issues at the

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organizational level, a more personal approach at the individual level can more quickly engage students with limited organizational experience and can build a bridge to better understanding of organizational and societal applications in the future. That is, if students first understand how to address climate change in their own lives, they may more effectively transfer and apply that understanding at organizational and societal levels, and ultimately synthesize solutions to address climate change in the world.

Today's management students are the future decision-makers and leaders of our organizations and society. One of the most crucial but challenging goals of higher education is application of knowledge and practices beyond the classroom and university life. Work by Cordero, Centeno, and Todd (2020) and Molthan-Hill, Worsfold, Nagy, Leal Filho, and Mifsud (2019) suggests that higher education may play an important role in laying the groundwork for lifelong sustainable practices. Additional work by Starik and Kanashiro (2021) suggests that sustainable practices at the personal level can facilitate practices at organizational and societal levels. By introducing students to climate change and how they can address it through individual-level actions, this exercise can help to lay the groundwork for lifelong learning and practices to address climate change at individual, organizational and societal levels.

Vocabulary

Climate change is most often defined as the ongoing increase in the Earth's temperature. Climate change is related to carbon emissions – that is, carbon dioxide in the atmosphere warms the planet, causing climate change. Therefore, actions to decrease carbon emissions can address climate change. It is widely believed that climate change is responsible for rising sea levels and greater frequency of extreme weather such as heat waves, droughts and floods. These events will continue to impact local, national and global economies, as well as human and environmental health, and national and global security (e.g. Fernando, Klaic, & McCulley, 2012). Therefore, current generations must decrease carbon emissions for the sake of both present and future generations.

The literature that addresses climate change uses verbs such as *decrease* to indicate reversing the Earth's temperature, as well as *mitigate* to indicate stopping or slowing the increase of the Earth's temperature. Because the scientific debate over decreasing or maintaining the Earth's temperature is not part of this exercise, the more neutral term of *address* will be used with respect to climate change, with the exception of citations from other sources.

Carbon literacy is one approach to understanding and addressing climate change, and education in carbon literacy is endorsed by the UN SDGs and PRME. Carbon literacy can be defined as:

> An awareness of the carbon dioxide costs and impacts of everyday activities, and the ability and motivation to reduce the emissions, on an individual, community and organisational basis. Carbon literacy is a term used to describe an awareness of climate change, and the climate impacts of mankind's everyday actions. (Carbon Literacy Project, 2023)

This experiential exercise helps students to improve their carbon literacy to address climate change through changes in their own lives.

Overview of the exercise

This exercise was used in an undergraduate management principles class, but it can also be used in other undergraduate management classes and can be adapted for use at the MBA level. It was used in an on-ground class but can be adapted to virtual (e.g. Zoom) and asynchronous online formats. In the virtual/remote format, breakout rooms and a white board can show work products. In an asynchronous format, large and small group discussions can be used.

One 75-min class was used for this exercise, and Table 2 responses are based on a 75-min class. Colleagues who observed the exercise suggested using two classes in the future (of 55–75 min each) to allow more time for student research, reflection and achievement of objectives. Table 1 presents a schedule for two classes. Time needed includes about 90–120 min outside of class for student preparation before classes one and two, as explained below. If time is short, the exercise can be done in one class.

Learning objectives

After completing the exercise, students will have achieved the following:

- Improved climate literacy (i.e. causes and types of climate change). (This is gained from the video.)
- Ability to develop and analyze action steps, at the individual level, to address a major cause of climate change. (This is gained from the team assignment.)
- Ability to analyze and evaluate their action steps and those of others, and come away with a diverse set of personal action steps to address the major causes of climate change. (This is gained from the team assignment, discussions and debriefs.)

Preparation

About a week before the exercise, instructors can remind students to watch the YouTube video ("Friendly Guide to Climate Change – and What You Can Do to Help," which runs less than 17 min: https://youtu.be/3CM_KkDuzGQ) [1], and create a list of at least three ways to address climate change in their personal lives. The list should be brought to class as food-for-thought during the exercise. The video supplies background information about climate change, its causes and some possible solutions. The information in the video is very clear so instructors do not need detailed personal knowledge of climate change. The YouTube page for the video includes a link to a United Nations page on climate change, with additional information the instructor can use to supplement their understanding.

Running the exercise

The class is divided into teams of four to six students. Each team is assigned a question developed (by the instructor) from the two major causes of climate change as described in the

Activity	Approximate time
Class 1	
Explain exercise and assign teams and questions	15 min
Teams develop, analyze, record and report responses to questions	20–30 min
Debrief 1, discussion and instructions for homework before class 2	20–30 min
Total	55–75 min
Class 2	
Teams record and report responses (based on homework between class 1 and 2)	30–40 min
Debrief 2 and discussion	25–35 min
Total	55–75 min

Note: Based on about six teams with four to six students per team
Source: Created by the author

Table 1. Approximate timetable for exercise

Question	Sample responses
a) How can you decrease consumption of fossil fuels for heating, cooling and household activities?	Wear heavier clothing when it is cold/lighter clothing when it is warm Lobby University and landlords to install heat pumps, solar panels and other alternative energy technologies
b) How can you decrease consumption of fossil fuels for transportation?	Bike and take public transportation when possible Buy locally produced products and foods Live close to school, work, shopping, etc.
c) How can you decrease deforestation to raise crops?	Create meal plans and shopping lists to reduce food waste Use smaller plates and trays in dining halls to reduce food waste Grow vegetables and fruits in backyards, pots and window boxes
d) How can you decrease deforestation to raise animals?	Eat less meat, especially beef Use meat as an ingredient in an entree, rather than as a main dish
e) How can you decrease deforestation for raw materials?	Give up precious gems – e.g. diamonds Lobby the University and others to not invest in companies that mine diamonds
f) How can you decrease deforestation for housing?	Demand/buy smaller houses Demand/buy smaller houses/dwellings Demand/build houses closer together

Source: Created by the author

Table 2.
Sample responses to team questions

video: burning fossil fuels and deforestation. Researchers including Driga and Drigas (2019) confirm how burning fossil fuels and deforestation are major contributors to carbon emissions and climate change. Each of these two topics can be divided into subtopics, for example:

- burning fossil fuels for heating/cooling/household activities;
- burning fossil fuels for transportation;
- deforestation to raise crops;
- deforestation to raise animals;
- deforestation for raw materials; and
- deforestation for housing.

Each team is assigned a question based on one of the subcategories above, for example:

Q1. How can you decrease your consumption of fossil fuels for heating/cooling/household activities?

Q2. How can you decrease your consumption of fossil fuels for transportation?

Q3. How can you take steps in your life to decrease deforestation to raise crops?

Q4. How can you take steps in your life to decrease deforestation to raise animals?

Q5. How can you take steps in your life to decrease deforestation for raw materials?

Q6. How can you take steps in your life to decrease deforestation for housing?

Team members develop and record responses to their assigned question and rank them by how quickly the practices can be undertaken. Teams can also evaluate the lists each member developed after watching the video, to determine whether they include appropriate answers to their assigned question. All team members must contribute at least one original response. Team members will also report responses on the board and to the class (3- to 5-min informal report per team). An approximate timetable is directly in Table 1.

Debriefing the exercise

The goal of the debrief is to reveal everyone's experiences with the exercise and to reinforce the learning objectives, as well as to compare and contrast all of the questions and responses from all of the teams. Some sample responses to the questions are in Table 2; these were based on running the exercise in one 75-min class. Colleagues pointed-out that these responses seemed simplistic, probably because students did not have enough time for thorough research, reflection and analysis in one class period. Hence, two classes are suggested for this exercise, as scheduled in Table 1.

In the two-day format, the first debrief and discussion (on day one) can elicit initial responses to the questions and record them on the board. The instructor can reinforce that the responses are actions we can take, as individuals, to address major causes of climate change. If there are same/similar responses to multiple questions – as is frequently the case – the instructor can point out the synergistic nature of some responses, in that one response/solution can address more than one cause/problem of climate change. If not, the instructor can elicit responses to a question such as, "Can anyone see how one response such as 'lobby the University' can address more than one question/address more than one cause of climate change?"

Additional questions for the debrief can further examine individual actions to address climate change and, at the same time, facilitate student recognition and evaluation of a diverse set of personal actions to address climate change. These can include, but are not limited to, the following:

(1) Consider all of the responses (or individual actions to address climate change) on the board. Which are the best fit for your lifestyle?

(2) Consider all of the responses on the board. How many of these can be implemented today, or within a few days?

(3) Consider the responses that will take longer to implement. About how long do you think they will take to implement and why?

(4) Which of these responses are free or almost free to implement?

(5) Can implementing any of these responses save you money or time, or improve your life in other ways?

Instructors can choose from a subset of the questions above, as time permits, and as is appropriate, given topics covered in the class. For example, if a class topic is the win-win nature of many pro-social behaviors, then question #5 is a particularly good one to include in the debrief. All of the questions – and the whole exercise – can be used to reinforce the topic of social responsibility, including how personal actions to address climate change are related to social responsibility. Instructors may reserve some or most of the questions above for day two of the exercise, as time allows.

Although some students may voluntarily disclose personal actions that they are already implementing, instructors may want to avoid directly asking or polling students about their personal practices to avoid any unintended appearance of shaming students who are not

currently taking actions to address climate change. Students may also share opposing points of view; for example, some may cite using reusable bags at grocery stores as a positive practice to address climate change, whereas others may share the opinion that reusable bags are less carbon friendly than recyclable paper bags provided in stores. These situations can be used to reinforce the existence of some ambiguity with respect to addressing climate change, and the need for more and better metrics, research and communication. Instructors can reinforce that this is also the case for other complex issues and problems in management and business, and in all fields. Because it is impossible to predict student responses with certainty, flexibility, openness and mutual respect typically result in positive outcomes for all participants.

After class one

At the end of class one and before class two, student teams can be instructed to further reflect upon the responses on the board, and do some additional research to gain a deeper understanding of individual behaviors and roles in reducing carbon emissions and addressing climate change. The instructor can offer additional questions and avenues for research, including follow-up questions based on team responses, for example:

(1) Re: Team response (in Table 2) of living closer to school/work and/or taking public transport: Would these actions result in significant carbon reductions – if so, about how much? (Students can Google, easily find EPA data, and calculate a 10%–15% reduction in tailpipe carbon if drivers drive just 50 fewer miles per week by living closer to work, working from home, etc. www.epa.gov/greenvehicles/tailpipe-greenhouse-gas-emissions-typical-passenger-vehicle#driving).

(2) What about measuring our individual carbon footprint (or how much carbon we create) in our everyday lives? (Carbon footprint calculators are easy to find online. This calculator includes multiple consumption categories, e.g. transport, food and dwelling, as well as tips for reducing our footprint: https://8billiontrees.com/carbon-calculator/report/?carbon=e383).

(3) What about other sources of carbon, such as the transport of our goods that are made abroad – electronics from China, clothing from Bangladesh, food grown and produced abroad? (This report details carbon emissions from global shipping: https://theicct.org/publication/greenhouse-gas-emissions-from-global-shipping-2013-2015/. This article details the carbon costs incurred as retailers source products from across the oceans: https://grist.org/climate/the-true-cost-of-shipping-junk-across-ocean-walmart-target/).

During class two, student teams can record and report their additional responses. The class discussion and debrief can focus on additional understanding from the additional research, including carbon footprints, global trade and consumption and the implications (both positive and negative) of purchasing only locally produced goods. This discussion could illustrate the complexity of addressing carbon creation and climate change, such as unintended negative consequences, e.g. business and economic downturns in countries like China, if all countries were to purchase only local goods. Likewise, the class could discuss possible negative, unintended consequences such as diminished purchasing power and quality of life for some individuals, especially those at/below the poverty level, if everyone had to purchase locally made goods.

Hence, this exercise can help students to gain an understanding of climate change and its causes and complexities, and learn how to implement a diverse set of personal actions to

address it, starting in the present and continuing throughout students' lives. In addition, this exercise may help students to make the leap from individual to organizational and societal practices when they are in the position to do so. The latter two levels of practices are beyond the scope of this exercise.

Note

1. *Addendum*: YouTube video for the exercise: "Friendly Guide to Climate Change – and What You Can Do to Help," 16:52 running time: https://youtu.be/3CM_KkDuzGQ

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