

UBC Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

**Local vs Global Approaches to Climate Change Education: Learning Experience**

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**Themes: Climate, Community**

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Local vs Global Approaches to Climate Change Education: Learning Experience

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In recent decades a scientific consensus has been reached – climate change is real, accelerating, and at least partially driven by human action<sup>1</sup>. Despite this knowledge, belief in anthropogenic (originating in humans) climate change is far from universal. In 2018, only 57% of adults in the United States believed that human actions played a major role in climate change, and only 65% believed that individual citizens should do more to prevent global warming<sup>2</sup>.

Various theories have been proposed as to why there is a gap between scientific consensus and popular belief in the necessity of environmental initiatives. Some theories suggest that lack of direct experience with climate change reduces feelings of personal risk. A study investigating the relationship between experience with climate change and pro-environmental attitudes found that people who had experienced extreme weather such as flooding were more convinced of climate change and concerned with its effects. They were also more willing to change their behaviours<sup>3</sup>. However, this concern was mediated by feelings of local vulnerability and perceived efficacy of action.

Investigating the notion of risk, researchers looked at public support for environmental initiatives in the US. They found that Americans were more likely to support initiatives to reduce pollution than initiatives to control resources, and found stronger support for local (and national) actions as opposed to global actions<sup>4</sup>. These findings support a personal risk hypothesis. In contrast, a study done in South Korea found that local concern predicted environmental action only to the extent that people were emotionally attached to their neighbourhood, and that global environmental concern was a more consistent predictor of pro-environmental behaviour<sup>5</sup>.

A cross-cultural study explored what common factors result in public consensus on climate change globally<sup>6</sup>. Researchers found that people with higher education were more likely to share common conceptions of climate change, implying that education may be the key to creating and maintaining support for effective global environmental initiatives. If education is the key, then the question of whether local or global educational information will best invigorate climate change concern in a populace becomes a critical one.

Our research question was to determine whether focusing on environmental issues in a local (Vancouver, BC) versus global (New Dehli, India) context affected people's support of climate change initiatives. We predicted that people who read the information about conditions in Vancouver would be more likely to sign a pro-environmental petition than those who read about conditions in India.

## Method

### Participants

The researchers used direct recruitment and convenience sampling of University of British Columbia (UBC) personnel (students, staff, and faculty) for this study. Over the course of two weeks (March 1 – 14) potential participants were approached on the UBC campus by a researcher and asked if they had time to complete a survey for a PSYC 321 research project. A total of 135 participants were initially recruited. Due to concerns with participants originating from India possibly confounding the local vs global effects, the two Indian participants, one from each condition, were excluded. Upon data analysis nine other participants were excluded due to incomplete surveys (N = 124). The local condition (n = 65) had 41 females, 21 men, two non-binary persons, and two participants that preferred not to provide a gender. The most common age group represented in this condition was 18 – 24 years. In the global condition (n = 59) the

most common age group was also 18-24 years. Participants included 39 women, 13 men, 5 non-binary persons, and three participants that preferred not to provide a gender.

### **Conditions**

This study was a between-subjects design with two conditions, local and global. Participants were placed in to a condition based on the researcher that approached them, three researchers were assigned the local condition and three were assigned global condition. Participants in the local condition received a news article that described the air quality in Vancouver, B.C. and the global condition received a news article for New Delhi, India. Vancouver was chosen as the local condition city due to it being the city in which UBC is set. New Delhi was chosen for the global condition because of the distance from the UBC campus and the low student population of Indian ethnicity at UBC compared to other ethnicities on the campus. Both conditions also received the same online petition and survey questions after the news article was shown. The independent variable was the location of interest in the news article (Vancouver or New Delhi), and the dependent variables were the participants' indication of willingness to sign the online petition, and the behaviour of actually signing the online petition.

### **Materials**

**News Article:** The researchers created two fake short news articles that described the polluted air in either Vancouver, B.C – local condition, or New Delhi, India – global condition (see Appendix A). Both articles were identical in wording except for specific location related information. The articles described the air quality in the area and mentioned how it was poor and more than 10 times worse than what is permissible in the country. At the end of the articles it was stated that climate changes can impact air quality and immediate actions needs to be taken to produce clean air, as it is a basic human right.

**Petition:** A local petition found on change.org proposing taking action to reduce carbon emissions in Surrey, B.C.<sup>7</sup> (see Appendix B) was used as a proxy for pro-environmental behaviour. We measured willingness by asking participants if they would be willing to sign the petition, and behaviour was measured by asking the participant if they *did* sign the petition. The petition was chosen for its accessibility on a free website, it's proximity to Vancouver, and its tangential relation to the topic in the news articles. The petition describes the necessity of reducing carbon emissions, previous success in Sweden, and exhorts readers action in emotionally-laden language. Upon signing, participants were also provided with an opportunity to donate or share the petition on social media. Results for this, and personal information that may have been provided were not tracked by this study.

**Online Survey:** A 16-question survey (see Appendix C) was created by the researchers to assess how learning about global or local environmental issues impacts sustainable behaviour, willingness to sign a petition (Appendix B). Participants were asked if they had signed the petition, to explain why if they had not, and how personally at risk they felt based on the information provided. Demographics questions were asked to determine age, gender, place of birth, and duration of their time in BC. Duration was important as we expected to have a significant number of international students in our sample, and those who had been in BC for shorter periods of time may be less likely to feel personally at risk from local information. To assess the impact of teaching environmental issues on environmental policies, participants were also asked to indicate if they had previous exposure to an environmental issues course. and whether that course affected their behaviour towards sustainability. The last two questions asked for political party orientation, and whether they believed their party supported environmental

initiatives, as previous research has indicated one of the greatest predictors of pro-environmental attitudes is political affiliation<sup>4</sup>.

### Procedure

Researchers approached potential participants on the UBC campus between the hours of 9:00 AM to 10:00 PM and asked if they would be willing to take part in a survey about climate issues as part of a Psychology 321 project. If the participants agreed the researcher then explained that the study would take between 5 – 10 minutes and would be completed on the researcher's laptop in the form of an online survey. The participant was made aware that all responses were anonymous, as the researcher would be facing away from the screen and participant as they completed the study, and there was no reward for their participation. The researcher then opened their laptop to the online survey and told the participant that they can end the study at any point without repercussions, and instructed them to read all questions carefully. After the instructions the participants were handed the laptop. The first page of the survey was a consent form that all participants completed. The second page of the survey was the short news article, either the local or global condition. After the participant read the article, they were asked whether they would be willing to sign a petition to reduce carbon emissions in Surrey. If no, they were directed to the remaining 15 questions of the survey. If the participant said yes, they were directed to the petition on change.org and then on to the remainder of the survey. After the participant submitted the survey, the researcher thanked the participant for their participation and gave a short debrief if the participant was interested.

### Results

A chi-square test of independence was performed to examine the frequency of people willing to sign a petition calling for the reduction of carbon emission in Surrey BC, in participants who were in local or global condition. It revealed no significant difference between our conditions.  $\chi^2(1) = 2.11, P > .05$  (See Appendix D, Figure 1). The p-value was .15. Being in the local or global condition showed no difference in willingness to sign the petition.

Another chi-square test of independence was performed to look at the frequency of people who signed the petition calling for a reduction of carbon emission in Surrey, BC, in participants who were in the local or global condition. Again, we did not find a significant difference between our conditions.  $\chi^2(1) = 0.62, P > .05$  (See Appendix D, Figure 2). The p-value was 0.43. Our results suggest that being primed to think locally or globally has no effect on eliciting minimally effortful pro environmental behavior such as signing a petition.

Upon further analysis, we noticed that there was a discrepancy between people who say they were willing to sign the petition and those who actually signed it. Using Fisher's Exact Test, we found that 13.2% of respondents in the global condition who said they *would* sign the petition responded to the question asking "Did you sign the petition?" with "No" (see Appendix D, Table 1). This figure had an effect size (Cramér's V) of 0.841, and a p-value of  $p < 0.00001$ . In the local condition, the percentage was 20%, with an effect size of 0.652, and a p-value of  $p < 0.00001$  (see Appendix D, Table 2). An additional chi-square test of independence was performed to see if being in the local or global condition had any effect on those who said they were willing but didn't actually sign the petition. The chi-square statistic was  $\chi^2 = 0.40, P > .05$ . The p-value was .53 and the results were not significant.

## Discussion

The research on the efficacy of global vs local climate education is inconsistent. One study<sup>5</sup> found that highlighting global information was more likely to promote pro-environmental behaviors. The authors argued that as the public gradually becomes aware of the threat to their quality of life under wide-spread turbulent environmental conditions, they gradually increased in support for pro-environmental initiatives. In contrast, others<sup>7</sup> suggest that a local message is more effective due to the stronger emotional attachment to local environments residents have, which causes them to be more willing to engage in pro-environmental behaviors. Based on the data collected in the current study, priming participants to think either locally or globally has no significant difference on their willingness to sign a petition calling for a reduction in carbon emissions. From this, we might conclude that thinking locally or globally would not significantly impact pro-environmental behaviors.

One possible explanation for this is that the choice of New Dehli, India as our global condition was not sufficiently 'global'. In choosing a specific city/country to contrast our local condition against, we may have elicited a 'distant' effect, rather than an effect that was diffuse but still relevant to individuals in a local setting. Previous studies looking at the issue typically used global terminology<sup>4,5,7</sup>, indicating that what we measured may be conceptually different. If this is the case, our data does not add in a meaningful way to the debate in question.

A potential confounding factor is the quality of our measure of behaviour. While we chose the petition because it was real, local, and at least tangentially related, we found that there was a statistically significant portion of our respondents who indicated that they would be willing to sign a petition that proceeded not to do so. Among the cited reasons for declining to sign were concerns with the trustworthiness of the website, errors in the factual information provided by the petition, the petition was not directly related to air quality, and laziness. In addition, at least one person in the global condition noted that Surrey has a large proportion of ethnically Indian residents and pointed out possible racial implications, a consideration we had not previously considered that could have significantly impacted the results of our global condition. Any of these factors may be limit the validity of our results.

One of the potential limitations in the present experiment is that there is no controlled condition, a condition that either had no priming message or had an environmentally-irrelevant message prior to the survey. Controlled conditions can be important since we could have used it to compare the two experimental groups with the control group to see whether the independent variables – local and global messaging – had impact on participants' willingness and behaviors, even if there was not difference between the two experimental conditions. However, since the present experimental concern more about the difference between two conditions, the we had deemed a control group unnecessary.

In terms of our sample, the result is based on 124 participants' data, with 104 of our participants between 18 to 24, 65% of which were female. The sample is not representative of the population at large, and therefore lacks generalizability. Another potential limitation is that 47 participants across both conditions were international students. Not only does this further muddle the effect of 'local' vs 'global', but according to Legislative Assembly of British Columbia, only residents are willing to sign a petition and international students' signatures do not count toward the required numbers<sup>8</sup>. If international students were aware of this, this may have reduced engagement with the behaviour measure in both conditions. To deal with this limitation, international students might need to be excluded in future studies, or researchers need

to assess participants awareness of provincial petition legislation.

### **Recommendations**

Going forward, it is possible to take two different tactics. If we take the results of the study as is, we might conclude that further educational initiatives need not worry about the locality of their information. However, given the flawed nature of our methodology, confounding factors, and non-representativeness of our sample, we do not endorse this approach.

Instead, we offer some suggestions for future studies. A larger and more diverse sample that is more representative of the public would greatly enhance the validity of future studies, particularly if they are able to implement random selection as opposed to convenience sampling. Another suggestion would be for future studies to choose a better measure of behaviour, either by choosing a higher-quality petition, creating one themselves, or choose a method to measure behaviour. Finally, greater attention needs to be paid to the internal validity of the 'global' construct. Taking steps to ensure the global condition was sufficiently in-line with previous research would have been an important step to take if we wanted our research to contribute significantly to the question of how education can increase pro-environmental behaviours.

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**Appendix A: News Articles**

*Global Condition* – by condition changes highlighted:

“New Delhi is engulfed in smoggy air that’s 10 times worse than what’s ‘permissible’”



The Indian capital of New Delhi has become enveloped in air quality so poor it’s as much as 10 times worse than what’s permissible in the country.

Air quality readings captured on Tuesday morning local time showed PM2.5 concentrations (a standardized measure of air quality) reaching as high as 419  $\mu\text{g}/\text{m}^3$  (micrograms per cubic metre) in the Sheikh Sarai area of New Delhi.

That’s over 10 times higher than 40  $\mu\text{g}/\text{m}^3$ , which is the “prescribed permissible standard” for air quality in India, according to a report by the Public Health Foundation of India and the Centre for Environmental Health.

“Climate changes can result in impacts to air quality. Atmospheric warming associated with climate change has the potential to increase ground-level ozone in many regions, which may present challenges for compliance with the ozone standards in the future.” Dr. Elizabeth Gorman, a University of Delhi environmental science professor said.

According to the Indian government and the World Health organization, immediate action needs to be taken because clean, breathable air is the most basic human right.

*Local Condition* – by condition changes highlighted:

“**Vancouver** is engulfed in smoggy air that’s 10 times worse than what’s ‘permissible’”



**Vancouver, B.C.** has become enveloped in air quality so poor it’s as much as 10 times worse than what’s permissible in the country.

Air quality readings captured on Tuesday morning local time showed PM2.5 concentrations (a standardized measure of air quality) reaching as high as 419  $\mu\text{g}/\text{m}^3$  (micrograms per cubic metre) in the **metro area of Vancouver**.

That’s over 10 times higher than 40  $\mu\text{g}/\text{m}^3$ , which is the “prescribed permissible standard” for air quality in **Canada**, according to a report by the Public Health Foundation of **Canada** and the Centre for Environmental Health.

“Climate changes can result in impacts to air quality. Atmospheric warming associated with climate change has the potential to increase ground-level ozone in many regions, which may present challenges for compliance with the ozone standards in the future.” Dr. Elizabeth Gorman, a **University of British Columbia** environmental science professor said.

According to the **Canadian** government and the World Health organization, immediate action needs to be taken because clean, breathable air is the most basic human right.

**Appendix B:** Petition - <https://www.change.org/p/decreasing-surrey-carbon-emissions-with-a-carbon-tax> (punctuation and emphasis unchanged from original)

## Decreasing Surrey Carbon Emissions.



570 have signed. Let's get to 1,000!



Thanks to your support this petition has a chance at winning! We only need 418 more signatures to reach the next goal - can you help?

**Take the next step!**



Janmeet Dhami started this petition to [Local Surrey Government](#)

A carbon tax (a form of pollution tax) assigns a **fee on the production, distribution or use of fossil fuels based on how much carbon is emitted**. Basically it makes it expensive for people to emit carbon into the atmosphere and destroy it. A tax would be efficient as it both, limits emissions of greenhouse gases, but also stimulates economic growth. This encourages the industrial sector to curb their emissions. **The success of the carbon tax is clearly visible in Sweden**, which was introduced there in 1991. Swedish factories have a cap on the the amount of carbon they are allowed to release, and this amount decreases each year, encouraging rapid growth in renewable resources. In fact, the Swedish environment minister Andreas Carlgren has said, **“Our carbon emissions would have been 20% higher without the carbon tax. It was the one major reason that steered society towards finding climate-friendly solutions.** It made polluting more expensive and encourage people and businesses to find energy-effect solutions.”. But really, if one wants to see the efficiency of Carbon Taxes, there is no need to look any further than **British Columbia itself**. The province’s (minimal) carbon taxing has already helped its economy outpace the Canadian national average, **disproving the myth of “job-killing carbon taxes.”** The province has also seen marked improvement in per capita fuel consumption and reduction in greenhouse gasses since the carbon tax was introduced. The province has proof to show that the carbon tax does not lead to the taxpayer having to pay significantly more taxes. In fact, BC residents have benefitted form associated tax rebates and reductions to the point that the average person actually pays less tax than they did before the carbon tax. The government actually offset income tax rates to offset the impacts of the carbon tax and **perhaps most importantly, each person can control how much carbon tax they have to pay**; it can be avoided by buying less gasoline, and avoiding the things that are related with greenhouse gases because that’s the whole point of the carbon tax, to encourage people to avoid it, by utilising more climate friendly options. The evidence is clear, a carbon tax is an effective,

relatively easy, and economically beneficial method of controlling greenhouse gas emissions, and it must be implemented deeply. It's time we all wake up and take some action, remember we only get **One Earth**.

**Appendix C: Online Survey (in three sections)***Section 1:*

Q16 Would you be willing to sign a petition that calls for reduced carbon emissions in Surrey, BC?

- Yes (1)
- No (2)

*Section 2: only shown if answer to Section 1 was “Yes”*

*Display This Question:*

*If Would you be willing to sign a petition that calls for reduced carbon emissions in Surrey, BC? = Yes*

Q16 <https://www.change.org/p/decreasing-surrey-carbon-emissions-with-a-carbon-tax>

We will not be collecting personal data from completion of this petition, your anonymity will be protected.

Once you have filled out the petition, please close the pop up window, and hit the "I have signed the petition" button.

*Section 3: shown either after signing the petition or saying “No” to initial question*

Q17 Did you sign the petition?

- Yes (1)
- No (2)

---

Q18 If no, why not?

---

Q2 Indicate your feelings to the following statements below.

	Strongly Disagree (8)	Disagree (9)	Somewhat disagree (10)	Neither agree nor disagree (11)	Somewhat agree (12)	Agree (13)	Strongly agree (14)
I feel personally affected by the information in the news article. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is important to support local environmental initiatives. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q4 How old are you?

- 0-17 (1)
- 18-24 (2)
- 25-29 (3)
- 30-34 (4)
- 35-54 (5)
- 55+ (6)
- Prefer not to say (7)

Q5 What is your gender?

- Woman (1)
  - Man (2)
  - Non-binary (3)
  - Prefer not to say (4)
- 

Q6 Were you born in British Columbia?

- Yes (1)
  - No (2)
- 

Q7 If no, where were you born and how long have you lived in British Columbia?

- Place of origin (City/Country) (1)  
\_\_\_\_\_
  - Years in BC (if less than 1, round up) (2)  
\_\_\_\_\_
- 

Q8 If you are a student, do you intend to stay in British Columbia after completing your education?

- Yes (1)
- Undecided (2)
- No (3)
- I am not a student (4)

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Q9 Have you ever taken, or taught, a class in environmental issues or sustainability?

- Yes (1)
  - No (2)
- 

Q10 If yes, did this class affect your long-term behaviours in a sustainable direction?

- Yes (1)
  - No (2)
  - I have not taken or taught a class in environmental or sustainability issues (3)
- 

Q11 Are you currently, or have you ever been involved in an environmental or sustainability organization?

- Yes (1)
  - No (2)
- 

Q12 If yes, how recently?

- Currently (1)
- Less than one year ago (2)
- Less than five years ago (3)
- More than five years ago (4)
- Never (5)

Q13 What provincial political party do you support, if any?

- British Columbia Liberal Party (1)
  - British Columbia New Democratic Party (NDP) (2)
  - Green Party of British Columbia (3)
  - Other (4)
  - None (5)
- 

Q14 Do you think your political party supports environmental initiatives?

- Definitely yes (1)
- Probably yes (2)
- Might or might not (3)
- Probably not (4)
- Definitely not (5)
- I do not support a political party (6)

**Appendix D: Results (Figures and Tables)**

Figure 1:

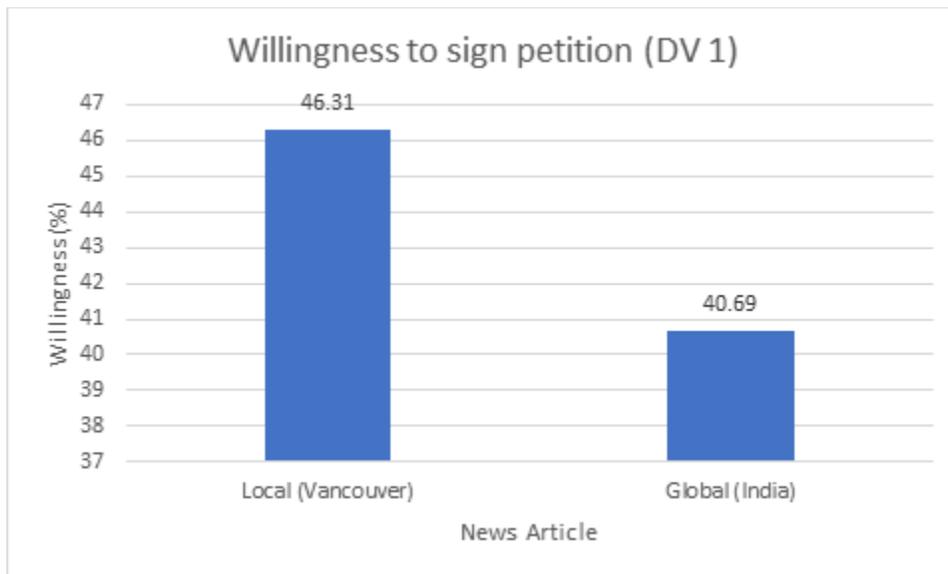


Figure 1, percentage of participants by condition who indicated a willingness to sign a petition to decrease carbon emissions in Surrey.

Figure 2:

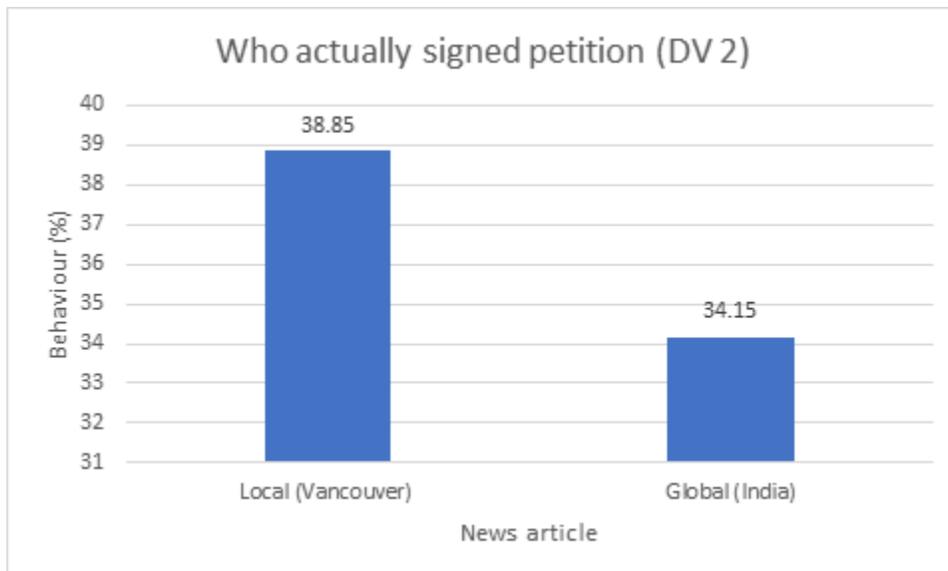


Figure 2, percentage of participants by condition who indicated they had actually signed a petition to decrease carbon emissions in Surrey.

Table 1:

**Global Condition - Willingness vs Behaviour**

Would you be willing to sign a petition? (willingness)	Did you sign the petition? (behaviour)		Total
	Yes	No	
Yes	86.8%	13.2%	100%
No	0%	100%	100%
Total			

Table 1, Fisher's exact test of the willingness measure against the behaviour measure in the Global Condition.  $p$ -value of  $p < 0.00001$ , Effect size (Cramér's  $V$ ) of 0.841

Table 2:

**Local Condition - Willingness vs Behaviour**

Would you be willing to sign a petition? (willingness)	Did you sign the petition? (behaviour)		Total
	Yes	No	
Yes	80.0%	20.0%	100%
No	6.3%	93.8%	100%
Total			

Table 2, Fisher's exact test of the willingness measure against the behaviour measure in the Local Condition.  $P$ -value of  $p < 0.00001$ , Effect size (Cramér's  $V$ ) of 0.652