

Systematic Literature Review

Challenges and Difficulties in Climate Change Education

Student related challenges:

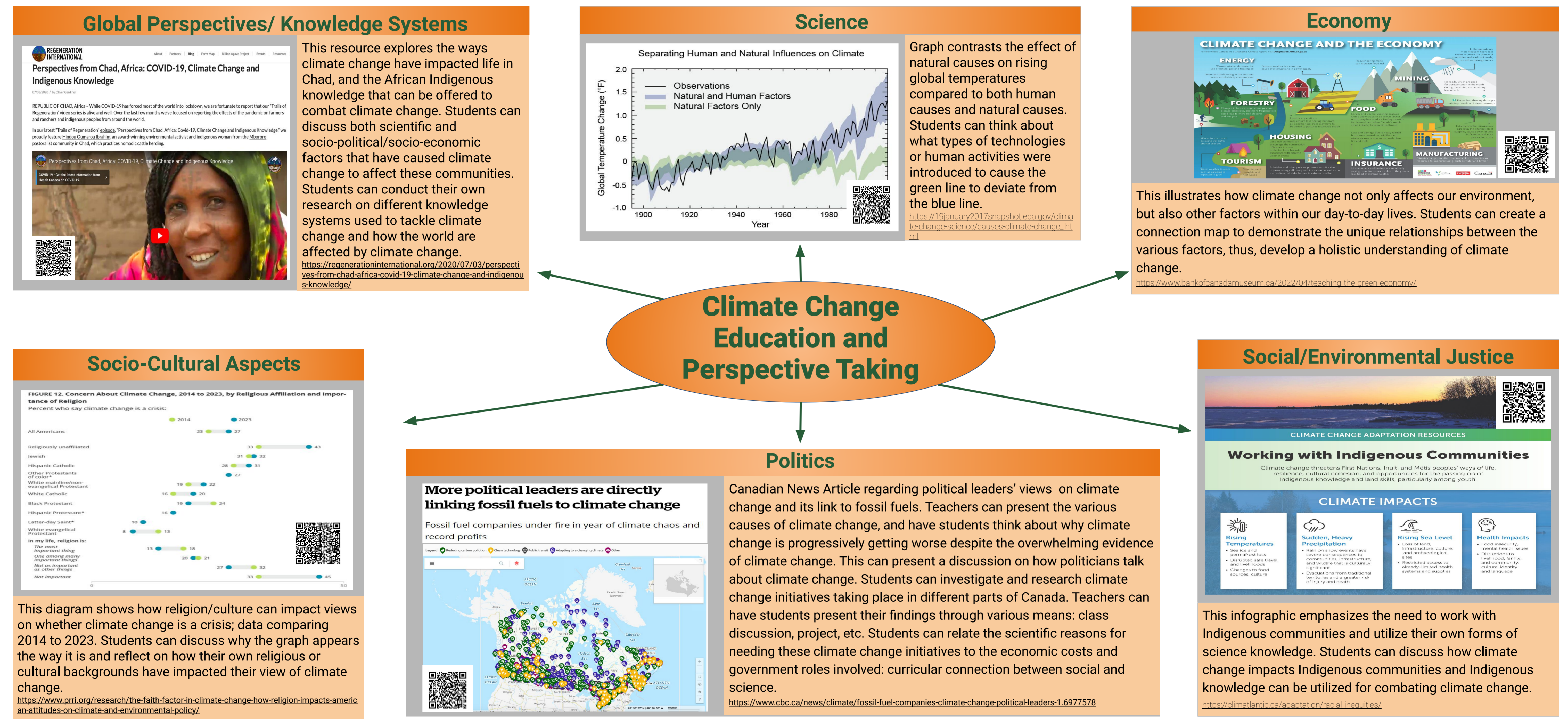
- Prior knowledge impacts understanding (You et al., 2018)
- Confusion between related concepts such as global warming, climate change [CC] and greenhouse effect (Dijkstra & Goedhart, 2011)
- Disbelief in the reality CC (Littrell et al., 2020)

Teacher related challenges:

- Lack of teacher training (Bush et al., 2019)
- Difficulties in making CC relevant to students (da Rocha et al., 2020)
- Disbelief in the reality CC (Namdar, 2018)

Other challenges:

- Lack of curricular support (Bush et al., 2019); inadequate resources (Littrell et al., 2020); not taught in a cross-curricular manner (Bush et al., 2019)



CHILDREN'S UNDERSTANDING OF CLIMATE CHANGE

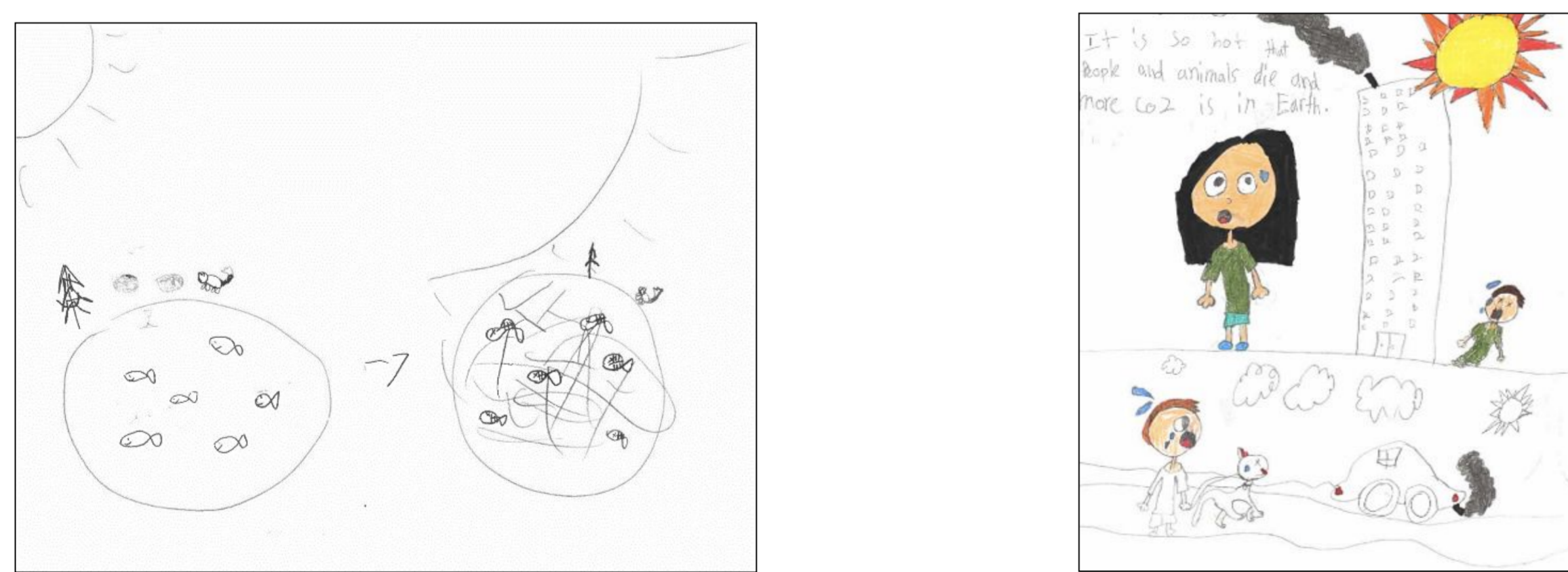
A small-scale case study with Grade 3-4 students

Participants: 7 Grade 3 - 4 students from the local Alberta community.

Context: 2-month, 5-sessions engagement on climate change topics.

Purpose: to investigate children's perspectives and understanding of climate change.

Findings: (a) Children exhibit awareness and concerns about climate changes.

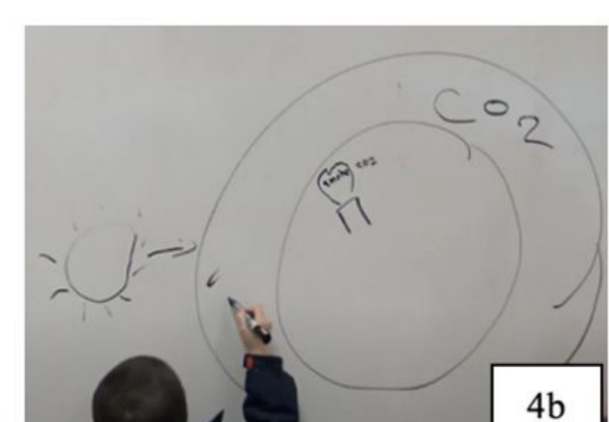
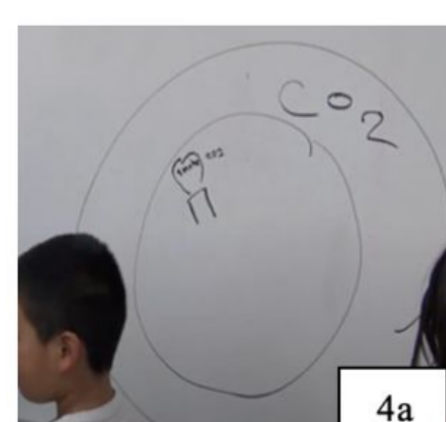


Misconceptions & alternative conceptions

Collective knowledge construction

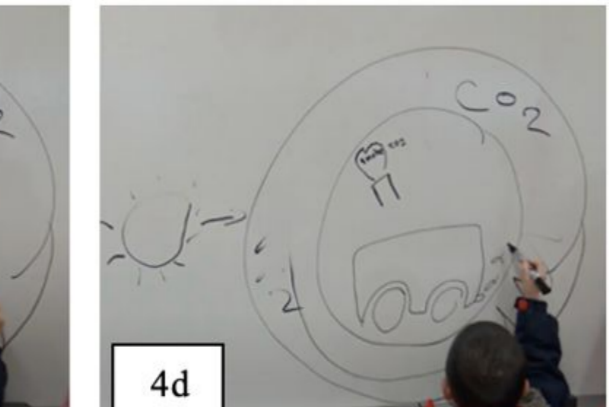
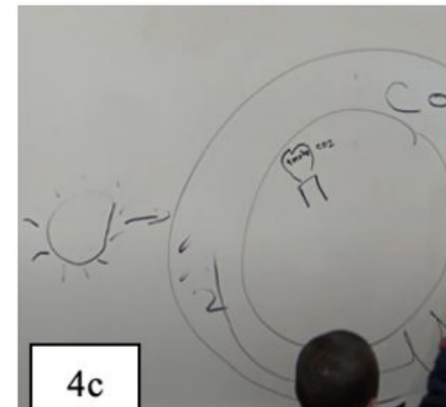
Critical understanding of 3R and environmental inequity

"climate change happens every year, it can start from warm to cold, and then [cold to] warm again."



"... the best is to reduce what we use ... then the last is to recycle. ... Recycling is bad, because the only way to recycle is to use a machine, emitting CO2 ... Maybe in North America, you have to ship it to Asia ... which is bad ..."

"the only thing that can make it [the Earth] cool is the moon."



As educators, we must acknowledge the intricate interplay of students' experiences, emotions, and understandings when addressing climate change in the classroom.

A PILOT STUDY on Student's Perspectives

Purpose: This study aims to find out Grade 5-6th students' perspectives and decision making on complex socioscientific issues in the context of land use and development during their learning on *Trees & Forests* in science classrooms (n=22).

Process: Inspired by everyday environmental problems, a scenario-based survey, *Land development in Alfa region* was developed. Students were asked to share their ideas on the scope of politicians, scientists, environmentalists, sociologists and parent perspectives. After the first survey, focus group discussions on diverse perspectives were conducted.

Throughout the unit, students learned various knowledge of trees and forests such as tree types, use and benefits of trees, conservations, human interactions with/in forests, etc.

Based on the students' perspective taking and discussions, the original survey was revised. Students took the revised survey and participated in focus group discussions and interviews to explain their perspective taking and decision making. In one of these discussion sessions, students were given some situations involving diverse perspectives on *Trees & Forests* and land development and asked to rank them, justify their ideas and explain what influenced their decision making.

Students' perspectives on forests, land development, and climate issues were analyzed and thematized.

Results: Based on data analysis, we found the following themes.

- Students prioritized the importance of environmental issues such as climate change in their decision making.

If it affects climate change, the area should not be disturb such as cutting trees. (Logan)
- Students demonstrated empathy for others in their perspective taking and decision making.

Why do we need it for us? What about people in Alfa Land? (Sonia)

It will destroy animal habitats ... They [mentioning animals] had to move to another home. (Tom)
- While students do not trust what politicians say, they fully trust what environmentalists say for their decision making.

If this was said by environmentalists instead of politicians, then I would accept this idea. (Jay)

They (environmentalists) ... make better decisions with the natural resources. (Tuba)
- Students emphasize Indigenous peoples' perspectives for their decisions.

... I think that climate change will affect the Indigenous peoples' lives more... (Olive)

We need to be educated with that kind of stuff is really important, and in our school, we talk about all this...I think it's really important to them. (Lisa)