SECONDARY SCIENCE TEACHERS' VIEWS ON CLIMATE CHANGE EDUCATION – CASE STUDY OF BC TEACHERS

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THEME:

Approaches and methodologies for STEM education research

BACKGROUND AND AIMS

There is growing global attention and concern about climate change and the link to human activity on the earth than natural factors. One way to address this problem is to increase the public's knowledge and actions to address this global emergency through climate education. The primary role of practical teaching and supporting students' learning about climate change is a science teacher (Meehan et al., 2018). Hence this study investigated secondary school science teachers' views on climate change and how it is framed or taught within secondary science curricula.

METHODOLOGY

To investigate BC secondary science teachers' views on climate change education, I employed a qualitative research approach. Drawing upon the case study design, I conducted interviews as the primary method for data collection and used a thematic analysis approach to organize and interpret the data. Six teachers from three different school districts, each with five years or more of classroom experience were recruited to participate in the study that sought their views on climate change through a series of semi-structured interviews. Each interview lasted approximately 40 minutes, and only the audio portion of the interview was recorded. All data were analysed using thematic analysis. The themes were related to the research questions under study and recurred among a preponderance of the participants.

RESULTS AND CONCLUSIONS

This study revealed what is required for the inclusion of climate change education in BC science curriculum and what teachers need to know and do to teach climate change. 1) The teachers' views on climate change and climate change education were based on science; 2) the teachers viewed the absence of climate change education in the current BC curriculum as a barrier to teaching climate change; 3) the teachers viewed effective climate change education as interdisciplinary, contextual and place-based. The study's findings have implications on how climate change topics and discourses can be framed in the local BC curricula including secondary school science curriculum and instruction.

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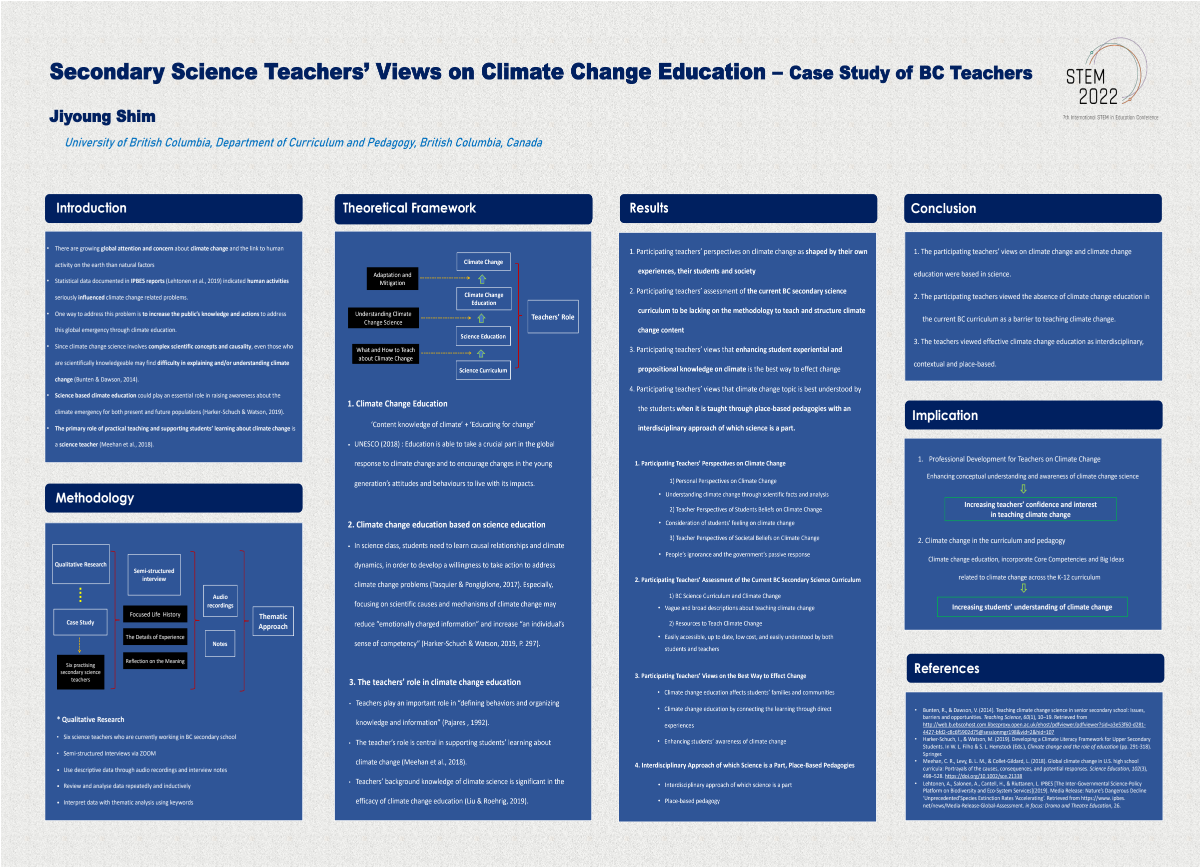

Secondary Science Teachers' Views on Climate Change Education – Case Study of BC Teachers

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Introduction

- There are growing **global attention and concern** about **climate change** and the link to human activity on the earth than natural factors
- Statistical data documented in **IPBES reports** (Lehtonen et al., 2019) indicated **human activities** seriously **influenced** climate change related problems.
- One way to address this problem is **to increase the public's knowledge and actions** to address this global emergency through climate education.
- Since climate change science involves **complex scientific concepts and causality**, even those who are scientifically knowledgeable may find **difficulty in explaining and/or understanding climate change** (Bunten & Dawson, 2014).
- **Science based climate education** could play an essential role in raising awareness about the climate emergency for both present and future populations (Harker-Schuch & Watson, 2019).
- **The primary role of practical teaching and supporting students' learning about climate change** is a **science teacher** (Meehan et al., 2018).

Methodology

Qualitative Research
Case Study
Six practising secondary science teachers
Semi-structured interview
Focused Life History
The Details of Experience
Reflection on the Meaning
Audio recordings
Notes
Thematic Approach

*** Qualitative Research**

- Six science teachers who are currently working in BC secondary school
- Semi-structured Interviews via ZOOM
- Use descriptive data through audio recordings and interview notes
- Review and analyse data repeatedly and inductively
- Interpret data with thematic analysis using keywords

Theoretical Framework

Adaptation and Mitigation
Understanding Climate Change Science
What and How to Teach about Climate Change
Climate Change
Climate Change Education
Science Education
Science Curriculum
Teachers' Role

1. Climate Change Education

'Content knowledge of climate' + 'Educating for change'

- UNESCO (2018) : Education is able to take a crucial part in the global response to climate change and to encourage changes in the young generation's attitudes and behaviours to live with its impacts.

2. Climate change education based on science education

- In science class, students need to learn causal relationships and climate dynamics, in order to develop a willingness to take action to address climate change problems (Tasquier & Pongiglione, 2017). Especially, focusing on scientific causes and mechanisms of climate change may reduce "emotionally charged information" and increase "an individual's sense of competency" (Harker-Schuch & Watson, 2019, P. 297).

3. The teachers' role in climate change education

- Teachers play an important role in "defining behaviors and organizing knowledge and information" (Pajares , 1992).
- The teacher's role is central in supporting students' learning about climate change (Meehan et al., 2018).
- Teachers' background knowledge of climate science is significant in the efficacy of climate change education (Liu & Roehrig, 2019).

Results

1. Participating teachers' perspectives on climate change as **shaped by their own experiences, their students and society**
2. Participating teachers' assessment of **the current BC secondary science curriculum to be lacking on the methodology to teach and structure climate change content**
3. Participating teachers' views that **enhancing student experiential and propositional knowledge on climate** is the best way to effect change
4. Participating teachers' views that climate change topic is best understood by the students **when it is taught through place-based pedagogies with an interdisciplinary approach of which science is a part.**

1. Participating Teachers' Perspectives on Climate Change

1) Personal Perspectives on Climate Change
- Understanding climate change through scientific facts and analysis

2) Teacher Perspectives of Students Beliefs on Climate Change
- Consideration of students' feeling on climate change

3) Teacher Perspectives of Societal Beliefs on Climate Change
- People's ignorance and the government's passive response

2. Participating Teachers' Assessment of the Current BC Secondary Science Curriculum

1) BC Science Curriculum and Climate Change
- Vague and broad descriptions about teaching climate change

2) Resources to Teach Climate Change
- Easily accessible, up to date, low cost, and easily understood by both students and teachers

3. Participating Teachers' Views on the Best Way to Effect Change

- Climate change education affects students' families and communities
- Climate change education by connecting the learning through direct experiences
- Enhancing students' awareness of climate change

4. Interdisciplinary Approach of which Science is a Part, Place-Based Pedagogies

- Interdisciplinary approach of which science is a part
- Place-based pedagogy

Conclusion

1. The participating teachers' views on climate change and climate change education were based in science.
2. The participating teachers viewed the absence of climate change education in the current BC curriculum as a barrier to teaching climate change.
3. The teachers viewed effective climate change education as interdisciplinary, contextual and place-based.

Implication

1. Professional Development for Teachers on Climate Change

Enhancing conceptual understanding and awareness of climate change science
⇩
Increasing teachers' confidence and interest in teaching climate change

2. Climate change in the curriculum and pedagogy

Climate change education, incorporate Core Competencies and Big Ideas related to climate change across the K-12 curriculum
⇩
Increasing students' understanding of climate change

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