

# Identification of Climate Change Action Competence Through Exploring Youth Environment Activists in Korea

Da Yeon Kang<sup>1\*</sup>, Hyeonjeong Shin<sup>1</sup>, Sung-Eun Lim<sup>1</sup> and Chan-Jong Kim<sup>1\*\*</sup>

Seoul National University, Seoul, Republic of Korea



**Abstract** Currently, science education research aims to engage students in understanding complex and controversial features of science and making their own decision and action about socio-scientific issues (SSI). As global environmental threats due to climate change have emerged, it became important for science educators to foster students' activism against climate change. However, few studies have explored how the education system can support students to carry on socio-political actions on global-scale environmental issues. Thus, this study aims to identify students' climate change action competence to set up clearer goals for SSI education. In this presentation, we will share findings from interviews with 14 youth environment activists who were members of a Korean youth-led organisation for climate change. This organisation led the school strike for climate change in Korea. We conducted semi-structured interviews in terms of their knowledge, perceptions, and experiences. Interview data were analysed based on the literature review (a priori codes) and researchers found emerging themes (inductive codes) while reading and discussing data. We found the components of climate change action competence, for example, desire to change conditions and belongingness in the group. We expect this can benefit other researchers in other countries to foster students' climate change action competence.

## Introduction

Currently, science education research emphasizes that science education should be aimed at engaging students in **socio-political actions as future citizens**, beyond teaching science itself (Sjöström & Eilks, 2017). From this perspective, students need to improve scientific literacy which allows them **to understand complex and controversial features of science and to make their own decision and action** about socio-scientific issues (SSI) (Sadler & Zeidler, 2009).

Although there have been only a few studies exploring education programs designed to help students identify their own issues and participate in social practices and actions, in terms of SSI (Bencze, 2017; Lee, 2018) – these programs have been shown to provide students with various and authentic opportunities to make their actions in SSI, but have not clearly identified what competences students need to be able to take action. To help define clearer goals for SSI education, **this study aims to identify action competences** based on interviews with youth activists for climate change.

## Theoretical Backgrounds

### Climate change issues in Korea

It is widely known that human activity has had a serious impact on the climate system which threatens humanity and the global environment. According to the 48th Intergovernmental Panel on Climate Change (IPCC) report (IPCC, 2018), the amount of carbon dioxide emissions should be reduced to less than half of the present in order to keep the global average temperature from rising to less than 1.5°C by 2100. Considering that Korea is one of the world's top 10 greenhouse gas emission countries, with the highest rate of greenhouse gas emission growth, policy implementation of Korea is desperate.

It seems that the **seriousness of climate change has gained consensus** among Korean society. Statistics show that 96.8% of Korean citizens surveyed were aware of climate change issues, and 90.5% were aware of its seriousness (Korean Environment Institute [KEI], 2016). Recently, similar to many other countries in the world, Korea has seen a growth in social movements to prevent climate change. For example, on September 21, 2019, there was a 'Climate change' rally attended by more than 5,000 citizens. In addition, **Korean youth also held a "School strike for the future" in March, May, and September in 2019** to argue the need for change in practices by the current generation and the government on the issue of climate change.



### Action competence

**Action competence** refers to **the ability to take responsibility for a problem and actively act to solve it**. Most studies on action competence have been conducted on environmental problems. Here we provide a review of the literature on action competence components.

Authors	Action competence components
Jensen & Schnack (1997)	• knowledge • insight • commitment • visions • action experiences
Breiting & Mogensen (1999)	• knowledge of action possibilities • a wish to act • confidence in own influence
Almers (2013)	• emotions creating a desire to change conditions • action permeation • outsidership and belongingness • trust and faith from and in adults • a core of values and contrasting perspectives • feeling competent and confident with what one can contribute
Vesterinen, Tolppanen, Aksela (2016)	• personal responsible action • value • participatory action • participation for future
Zhan & So (2018)	• knowledge • a wish to act • self-efficacy • action experience
Dittmer et al. (2018)	• knowledge about environmental issues • visions for alternatives • reflection on knowledge and experience within the context of one's values • the ability to engage in collective action

## Research Methods

### Participants

- **14 Youth change activist** (ages 14-18) who participated in at least one school strike (4 males : 10 females)
- 10 of the participants were members of the **youth-led organisation called 'Youth Action for Climate Change (YACC)'**. YACC was the main agent responsible for the 'School strike for climate change' held in March, May, and September in 2019.
- The remaining 4 participants independently participated in the strike in September.

### Data Collection and analysis

- The identification of action competencies was conducted using the **critical incident technique (CIT)**. CIT is a research method for collecting and identifying an individual's attributes that result in a specific outcome based on valuable actions or critical incidents (Flanagan, 1954). Researchers can collect detailed context and content of the incident by recording or interviewing individual incidents (Gremler, 2004).
- Single semi-structured/in-depth interviews (about 60 minutes) and follow-up emails to clarify their comments were conducted.
- Interview questions were formally developed by researchers through meetings with the manager of 'YACC'. Questions included various aspects in terms of participants' knowledge, perceptions, and experiences related to climate change issues. Researchers sent the question list to the YACC and finalised the questions based on YACC members' comments.
- The data analysis process was repeatedly conducted via **deductive and inductive methods**. Researchers developed a priori codes based on a literature review and found emerging themes while reading transcribed data. Action competence components were revised more than 10 times to meet consensus among researchers (inter-rater reliability). The final model was presented to the larger research group and reviewed by external audits.

## Emergent Findings

In terms of the action competences expressed by youth climate change activists, researchers identified **8 competences involving 3 sub-competence groups (seen below)**. Here, we provide detailed descriptions of each competence group and competences. We also give some examples of competences with excerpts from participants.

### Socio-Scientific Issues Action Competence

#### Integrated Thinking

- Scientific understanding
- Social understanding

#### Strategic Performance

- Action planning
- Social influence expansion
- Reflection and improvement

#### Social Vision

- Issue awareness and empathy
- Social responsibility
- Vision sharing and sustaining

### Integrated Thinking Competence group

#### 1. Scientific understanding competence

Competence to understand the causes and harms of issues from a scientific perspective

*I think **carbon dioxide emission** is the cause. When we emit carbon dioxide, **infrared radiation** from the earth is absorbed by **greenhouse gases**, and the temperature of the earth increases gradually, which melts the **glaciers** and reduces the amount of the Earth's reflection of **solar energy**. Climate change is a recurring cycle in which temperatures continue to rise and accelerate. (H.S)*

#### 2. Social understanding competence

Competence to understand the causes and harms of issues from a social perspective

*I realized that the damage caused by climate change is inseparably related to **human rights**. It became important to me to recognize climate change as a problem for **people around me or the more socially disadvantaged**. (D.H)*

### Strategic Performance Competence group

#### 1. Action planning competence

Competence to set social action plan meeting their goal

*We set the target first. We set the **aim and purpose** of the action and whom we want to **target**. (S.K)  
The action message was selected based on the **exact material and data** (S.Y)*

#### 2. Social influence expansion competence

Competence to know and utilize how their action influence socially

*I thought it was most important to be **exposed to the media**. So I did a lot of media actions in advance (Y.J.)*

#### 3. Reflection and improvement competence

Competence to reflect on action and improve action to a sustainable form

*I realized that when the internal core team collapses, the whole action collapses. I concluded that there should be **overall changes** in organizational and human resource levels **for action to be sustainable**. (Y.G)*

### Social Vision Competence group

#### 1. Issue awareness and empathy competence

Competence to be aware of the seriousness of the issue and empathize the harms on 'me and my generation'

*Even if I study hard and prepare, climate change may affect me **not able to achieve my dreams in the future**. I realized that climate change has a very **serious impact on the lives of my generation**. (H.N)*

#### 2. Social responsibility competence

Competence to realize that the subject of action is 'me' and participate independently

*Climate change will be more serious in the next generation. I wish **my generation could stop** the adverse effects of climate change, so I participated in the action (J.W)*

#### 3. Vision sharing and sustaining competence

Competence to sustain making changes through solidarity with those who act based on the same social vision

*When I went to the strike, there were a lot of **people with similar claims with me**. I was happy realizing that it wasn't my own thoughts and claims, but **our thoughts and claims**. (H.R)*

## Future Research

This study is a part of larger **research project to design and implement SSI educational activities for cultivating actions to cope with climate change** in the context of school clubs. Based on the action competence components identified in this study, we will conduct research to

1. **identify structures** that afford or constrain the agency of youth activists engaging in social action against climate change
2. **develop an education program designed** to support students to foster their identities as activists who can affect change in both their local and global society.

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