

DOI: 10.2478/jtes-2025-0019

*Journal of Teacher Education for Sustainability,*  
vol. 27, no. 2, pp. 60–82, 2025

# Silent Communication: Pedagogical Pathways Between Environmental Agents' Internal and External Conversations in School Climate Change Action

Ganes Gunansyah

<https://orcid.org/0000-0002-2241-9967>  
Universitas Negeri Surabaya, Surabaya, Indonesia

Suryanti

<https://orcid.org/0000-0003-0341-2716>  
Universitas Negeri Surabaya, Surabaya, Indonesia

Neni Mariana

<https://orcid.org/0000-0001-5791-4071>  
Universitas Negeri Surabaya, Surabaya, Indonesia

## Abstract

This study explores how environmental agents in schools transform reflexive internal conversations into external communication oriented toward achieving shared understandings in climate change action. This conceptual framework combines Margaret Archer's modes of reflexivity (communicative, autonomous, meta-reflexive, and fractured) with Jürgen Habermas's typology of communicative action (instrumental, communicative, and strategic). The reflexivity layer assesses how agents think and act, while the communicative action layer assesses the importance of knowledge and the direction of action. Using a critical ethnographic approach, this study uncovers hidden realities through offline and online conversations between environmental agents during school climate action. The results reveal teacher-student interactions that can be empowering and limiting, shifting between dominance, interdependence, connectedness, and disconnection. These conditions are influenced by the extent to which opportunities for reflective monitoring are provided through dialogue, discussion, and deliberation. Key findings reveal that silent communication connects internal reflection with external dialogue as a bridge between personal agency and collective action. This study highlights the pedagogical implications of integrating communicative action with reflexivity in strengthening Education for Sustainable Development through climate change action in schools.

**Keywords:** Climate change, communicative action, education for sustainable development, environmental agency, reflexivity, silent communication.

## Introduction

Education has been widely recognized as a driver of the Sustainable Development Goals (SDGs), particularly Goal 13 on climate action (Mensah, 2019). The SDGs provide the foundation for Education for Sustainable Development (ESD) (Sinakou et al., 2019; Sinakou et al., 2018); in which addressing climate change is an integral element (Sato & Kitamura, 2023). While ESD can integrate climate issues into the curriculum (Parry & Metzger, 2023) and prepare young people for future challenges (Dunlop & Rushton, 2022), criticisms remain. Academics highlight the dominance of market-oriented solutions (Jickling & Wals, 2012), the growth paradigm (Kopnina, 2020), and the reliance on technological solutions (Wijesooriya & Brambilla, 2021). Therefore, Zandvliet and Paul (2023) assess that ecological problems are challenging to understand and solve without a deep understanding of society.

In the Indonesian context, research on climate change remains limited to climate change adaptation strategies (Suhaeb et al., 2024), environmentally friendly activity initiatives (Chen et al., 2022), the appropriateness of program implementation and evaluation (Wibowo et al., 2023), and the framing of carbon emissions in the mass media (Kusnadi & Ayu, 2024). However, they fail to explore sources of hope through the mediation process of reflexivity and how environmental agents construct communication actions in implementing the Global Action Program (GAP) on climate change. Meanwhile, in the global debate on ESD, the pedagogical dimension is often overshadowed by technical and structural issues and limiting and enabling conditions. This gap risks overlooking how internal beliefs are forged, tested, and transformed through communication exchanges.

Climate reflexivity is the feeling that one is part of a broader natural environment in which climate plays a crucial role, and one's actions have an impact (Haugseth & Smeplass, 2023). Hillen (2020) states that communication is necessary to foster shared responsibility and enable capacity building at the individual and organizational levels, such as in schools. However, in communication, communicators sometimes seek only to gain their partners' approval for what benefits them; deception or violence can even be used to achieve desired outcomes (Schoop, 2021). Addressing environmental issues and the future planetary crisis requires transitioning from internal conversations through personal reflexivity to external conversations through intersubjective communication. Therefore, there is a need to address how pedagogy can foster reflexivity and communicative engagement on climate change.

On the one hand, it is important to emphasize critical reflective awareness and environmental awareness. On the other hand, it is necessary to ensure that the process avoids practices of distortion and domination. Archer's (2003) theory of reflexivity highlights the internal conversations that guide individual action. Habermas's (1985) theory of communicative action emphasizes the dialogical processes through which individuals engage social actors to negotiate shared understanding. For Archer (2012), individuals can practice personal reflexivity (internal conversation) when social structures

are perceived as constraining or enabling. Reflexivity is Archer's fundamental notion, mediating between agency and structure and characterized by four modes of internal conversation: communicative reflexivity, autonomous reflexivity, meta-reflexivity, and fractured reflexivity. Meanwhile, Habermas (1985) distinguishes between instrumental, strategic, and communicative action. Communicative action is crucial for climate change because it relies on dialogue, shared understanding, and consensus, rather than solely on instrumental goals. In other words, social situations must occur without repression/threats and without ideological barriers that could disrupt emancipatory discussions.

However, these two frameworks tend to be positioned and treated separately. Archer (2012) considers communicative reflexivity to have a reproductive effect within existing reflexivity, while autonomous reflexivity and meta-reflexivity have a transformative character. However, Archer's view of internal dialogue is not without its critics. Caetano (2014) highlights her reluctance to link routine actions to cultural conditioning. Burkitt (2016) considers Archer's dualism to hinder the emergence of a truly dialogical or intersubjective perspective. For Burkitt, Archer tends to favor meta-reflexivity and autonomous reflexivity over communicative and fractured reflexivity (Burkitt, 2016). Although often viewed and applied separately, there is a need to address the complementary dimensions of agency: personal reasoning through reflexive mediation and collective reasoning through communicative action.

This study involves school teachers and students as internal environmental agents responding and reacting to the global climate change agenda brought by Education for Sustainable Development in Indonesia (ESDI) as an external environmental agent. In this study, borrowing Archer's concept, ESDI is called a Promotional Interest Agent (PIA). Meanwhile, teachers and students are called Primary Agents (PA). There are two teacher agents, namely the Program Supervisor Teacher (PST) and the Extracurricular Teacher Assistant (EAT), and the Student Agent (SA). Through a pedagogical framework that connects Archer's concept of reflexivity with Habermas's communicative action, this study aims to address the gap in how school environmental agents navigate the transition between reflexive internal dialogue and external communication in climate action in schools. By combining this framework, schools are understood as pedagogical arenas where communicative practices and reflexive agency intersect. This approach highlights how knowledge is transmitted and how students and teachers critically engage with climate change as a real and contextual issue.

## **Method**

This research uses critical ethnography to uncover freedom, pressure, and behavioral restrictions in environmental education practices in schools. Repression as a situation means that thoughts and actions are limited or constrained, and individuals do not have the opportunity to explore alternatives, including environmental education practices in schools (Thomas, 2011). This research investigates how the PIA organized a climate change GAP in a high school in Indonesia as a participant in the 40 Days Challenge for Sustainability (40-DCfS) competition. Referring to Habermas's formulation cited by Kohn (2001) regarding discourse ethics, (1) every student who has the competence to speak

and act is allowed to participate/be involved in a discourse; (2a) everyone is allowed to question any statement; (2b) everyone is allowed to insert any statement into the discourse; (2c) everyone is allowed to express their attitudes, desires, and needs; (3) no speaker can be prevented, either by internal or external coercion. This emphasizes equality and freedom for all participants, especially the freedom to engage in critical discourse to express attitudes, desires, and needs, and freedom from all forms of coercion.

Data collection began intensively in February, during the program's initial introduction or socialization, and continued through June 2023, during initial planning, implementation, reflection, evaluation, final selection, and the announcement of competition winners. Throughout the nearly two-month program, researchers spent time with teachers and students conducting moderated participant observation, participating in online and offline conversations, conducting informal interviews, taking photographs, and taking field notes during the 40-DCfS competition. Informants in this study included two teachers – one female (PST), a senior teacher overseeing Environmental Education (EE) and the vice-principal, and one male (EAT), a part-time teacher recruited by the school with a background in environmental activism –, 22 students, consisting of nine males and 13 females aged 16 and above (SA), and one male ESDI leader (PIA). The student informants were a combination of two extracurricular programs: PLH (Employment and Community Service) and the Youth Scientific Group (KIR), members of the 40-DCfS team.

The research procedures for critical ethnography are generally similar to those of traditional ethnography; the differences lie in the type of data, which uncovers hidden data, and the level of analysis, which goes beyond descriptive narrative. According to Thomas (2011), the primary stage of the critical ethnography method lies in analyzing whether ideological restrictions and closed access to participation have occurred. The collected data is then transcribed, identified as items and units, categorized to identify key themes, and interpreted through a process of conscientization, which involves viewing reality within social processes as unbalanced, resulting in only a surface-level reality (Carspecken, 2020). Interpretation in critical ethnography is a process of defamiliarization that allows researchers to avoid taking certain aspects for granted. This means that researchers not only accept the data they encounter but must carefully critique and reframe it in new ways. At this stage, it is hoped that alternative interpretations can be provided to compare or even replace the dominant interpretation, which is repressive and anti-emancipatory. To comply with ethical academic research criteria, participants completed a consent form detailing the research objectives and procedures to protect their privacy before the interview. To prevent unethical violations, this study addressed anonymity, confidentiality from third-party access, the freedom of participants to withdraw from the study, and obtaining voluntary consent from informants. Specifically, for collecting online conversation data via WhatsApp, data was collected through a free, informed consent request, and participants were communicated with internally to provide permission and consent to provide transcripts of the conversations.

## Results

The explanation in this section, in addition to demonstrating the existence of various modes of reflexivity according to Archer's typology and the tendencies of knowledge interests according to Habermas's typology of communication actions, also reveals a remarkable conversation among students, a form of silent communication that lies between internal and external conversations.

### **Reflexivity and the Communicative Mediation of Environmental Agents**

Climate change is used as an issue and a gateway for global action in schools. The goal is to ensure this issue receives greater attention, rather than simply being an additional element in the curriculum and learning. PIA aims for education to support and contribute to successful development by making climate change a gateway. Schools, through the Climate Change Education Program, are expected to contribute to implementing ESD as a derivative of the SDGs. By framing the discourse of SDGs, ESD, and climate change, PIA is interested in transforming the global agenda into a shared knowledge construction, particularly for classroom action in schools. When asked what the organizers' hopes were, one of the PIA leaders and initiators stated that it was an effort to raise awareness and take concrete action to address climate change by addressing the three pillars of development:

[...] at the very least, we can educate schools and students that climate change is not just nonsense. However, the common challenge [...] We want to know how they can develop character-building habits in 40 days, at least [...] So, the three important things are often considered partial because there are three pillars of ESD: economic, environmental, and social [...] If it can have an economic impact, that is even better. [...] So, for example, there are plants, then there is fruit processed, sold, and consumed by the community. In this way, all three needs will be met economically and socially. Socially, how is community involvement? Economically, how can the resulting products be sold and distributed without packaging? (Interview, PIA leader)

This statement demonstrates the PIA's desire for schools to contribute to implementing ESD, including through environmental responsibility and acting as climate change drivers. Furthermore, the PIA views economic considerations as the primary driver of social and environmental considerations and emphasizes the development narrative as a central perspective on climate change. This framework encourages schools to focus on actionable solutions, particularly disaster management and reduction efforts through adaptation and mitigation, sustainable lifestyles and environments, and environmental conservation efforts. When asked why the focus is more on management than prevention, the PIA acknowledged that implementing preventative measures is difficult. Possible efforts are limited to simple steps to mitigate its impacts:

[...] Yes, it is challenging to prevent it if climate change becomes a global issue. There is no way we can protect ourselves; it is impossible. That is

why what we can do is address it. We can achieve this through simple steps to mitigate its impacts. We cannot stop climate change, which has been happening for a long time [...] What can we do? We will address it in small, concrete ways, by being disciplined in waste management [...] I did not provide details about what they wanted to do; let the participants explore their competencies. (Interview, PIA leader)

From this statement, the PIA views mitigation measures, particularly efforts to build awareness and action on sustainability, as “small actions”, concrete but straightforward actions; A simple example is discipline in waste management. Mitigation efforts are the main framework compared to prevention, which includes small but concrete efforts, such as disciplinary action regarding waste. The PIA is an environmental institution that works at the structural level to determine and monitor what needs to be done to achieve specific results. In organizing activities, the PIA is interested in promoting the implementation of the SDGs and ESD in schools.

The application of the scientific approach used by PIA in addressing the issue of climate change begins with questions about the definition, impacts, causes, triggering factors, and the origin of the triggers. First, the definition: What is climate change? Climate change is defined as changes in temperature and weather patterns over a long period of time. Second, the impact: What are the effects of climate change? This effect manifests as an increase in air temperature, which causes permanent ice/snow to melt. This impact causes an increase in sea water volume, which can lead to changes in coastlines; extreme weather, such as storms, extreme droughts, the extinction of particular living organisms, and the spread of certain diseases. Third, what are the causes? The greenhouse effect is explained as an increase in gases that trap heat reflected by the Earth. Fourth, the triggering factors: What causes the greenhouse effect? This effect is caused by carbon dioxide, methane, nitrous oxide, fluorine-containing gases, and hydrofluorocarbons. Fifth, the origin of the trigger: Where do these gases come from? It is explained that these gases originate from carbon dioxide, natural factors, and are derived mainly from human activities, particularly combustion. Methane is produced by agriculture and livestock, industry, household waste, the combustion of exhaust gases from industries such as the semiconductor and aluminum industries, and refrigeration. Regarding the conceptualization of climate change, the PIA appears to use the material reality of increasing average Earth surface temperatures due to increased greenhouse gases.

Based on these agendas, perspectives, and discourses, the PIA then develops guidelines, criteria, product and assessment standards, procedures, and activity mechanisms in the form of performance, control, and monitoring plans. These instruments are developed and prepared for operation to guide behavior in achieving program goals or success. This objective aims to regulate how actions are taken regarding the impacts and mitigation of climate change, which is the program’s primary objective. Therefore, this approach emphasizes monitoring and predictive action based on action implementation guidelines and criteria. Throughout the competition, the PIA also imposes several constraints, such as determining the theme and focus of the actions, but these constraints are not entirely rigid. The defined perspective and discourse limit participants, but agents in schools

still have room to explore environmental action ideas. The PIA monitors the actions by controlling and supervising them and provides consultation and feedback in the form of corrective notes.

Furthermore, the PA, consisting of the PST, EAT, and SA, is the primary actor in the school's 40-DCfS climate change action. The PST's role and position are as a mediator, bridging the interests of the agents' program success, promotional interests, and the needs of the agents in the school to achieve program goals. The PST's presence is crucial because its initiatives can revitalize previously stagnant extracurricular environmental education programs. To achieve this, the PST emphasizes the need to start with small actions for sustainable living:

[...] this was an extraordinary experience. Our children are changing the culture [...] the experience of changing mindsets, from initially being less caring to more caring [...] how we can instill small actions like reducing single-use plastic, not throwing away food, vegetable scraps, and so on. This has a significant impact on sustainable living. Of course, this is not easy for us to understand, but it can be done because all supervising teachers always set an example for the children. (Interview, PST)

This statement demonstrates that the PST can condition SA to share roles according to their expertise and support each other in achieving common goals. The PST acknowledged that the competition requires patience, perseverance, and tenacity to carry out activities for 40 days while students are simultaneously busy fulfilling competition bills and completing routine schoolwork. The PST also acknowledged that the 40-DCfS competition requires them to create and prioritize programs. Furthermore, the PST also hopes that this competition will be a platform for collective learning and exchange of ideas:

[...] many gases contribute to global warming [...] Methane gas can come from livestock waste such as cows, chickens, and so on [...] One program is enough, but many concrete actions [...] Yes, one program has many actions, innovative, creative, wow, this has to be genuinely new and interesting [...] This was an extraordinary experience for us to be able to manage our time to keep the program running under any circumstances [...] So, behavioral change starts with ourselves as program implementers and those exposed to the program [...] I conveyed to the children and my colleagues that this is not just a competition but a platform for collective learning and exchanging ideas about the importance of environmental awareness and care. (Interview, PST)

This statement indicates that the PST has facilitated communication through discussions, questions, answers, and dialogue with EAT and SA. During these opportunities, agents sought to exchange opinions and perspectives while striving for mutual understanding. However, the PST emphasized that the climate actions undertaken during the 40-DCfS program were intended to revitalize stalled environmental action, and they were eager to achieve school success by winning the competition. In a face-to-face conversation about potential solutions, several terms such as carbon tax, mitigation, and adaptation emerged. The SAs tried to listen attentively but sometimes expressed confusion about the PST's explanations. In response, the teacher encouraged the SAs to

feel free to ask questions and actively share ideas. As demonstrated in one conversation:

[PST]: Do not hesitate, the important thing is to provide positive comments, as long as they do not criticize each other. By optimizing the natural resources in the form of plants around us, we can process and manage them into food substitutes for meat-based side dishes. [SA-1]: Ma'am, reducing meat and fossil fuel consumption seems the most challenging. [PST]: Yes, yes, yes... for example, one motorcycle with two riders [...] What are the vulnerabilities here? Please discuss among yourselves what the vulnerabilities are here. (Offline conversation)

In the conversation, although the PSTs had allowed the SAs to make suggestions and ask for confirmation, the information provided seemed inadequate, hindering discussion and dialogue. Even after the PST delivered the information, some SAs frowned, and others lowered their heads in a confused manner, as if struggling to understand and asking for more concrete examples. There were two terms the SAs were previously unfamiliar with and difficult to differentiate: mitigation, adaptation, and prevention. The PST even acknowledged that some students remained skeptical toward the end of the competition about the importance of adopting a plant-based diet and consuming freshwater fish as a form of awareness and sustainable action in combating climate change. As the PST acknowledged:

...when asked, "You have already started. The activity is almost over, why are you still hesitant?", the student replied, "I do not understand. How can a plant-based diet and freshwater fish reduce the impact of global warming?" (Interview, PST)

This statement demonstrates the SAs' persistent skepticism about the program's actions. Some students even admitted doubting the PST's proposed actions, ultimately deeming them ineffective.

EAT's reflections differed from those expressed by PST. Although both are teachers, the EAT's perspective was more critical. Regarding the urgency of competition, the EAT stated that competition was necessary, but the most important thing was that students and schools should use it to measure their abilities. When asked about school community involvement during the 40-DCfS competition, EAT criticized that students were often asked to care for plants, but other school members, including teachers, did not participate, giving the impression that students were being bossed around. In addressing and responding to this situation, the EAT saw the need to encourage students to continue expressing and exploring their opinions:

[...] it is more a result of their hesitation to express their desires. I want to chat, for example, what else can we do? Let us explore here [...] I hope that if there are problems, we can talk about them. (Interview, EAT)

Regarding this situation, the EAT highlighted the need for equality between teachers and students while maintaining civility. Teachers are expected to take the initiative and proactively engage and motivate students. The EAT believes that teachers and students need to learn together, but they must also put aside their arrogance:

[...] so, for example, there are programs where children are given orders. Teachers must also be part of the school community, so they must be

"legowo" [open to accepting] and caring for the plants [...] I have not seen them [the entire school community] working together as a whole [...] that hegemonic character still exists. Like instructions or commands from teachers [...] your [teacher's] arrogance must be eradicated. This is more about lifelong learning; teachers and students learn [...] The point is to understand equality, encourage students to speak up, and be more friendly with them, although customs and politeness must still be upheld. (Interview, EAT)

The EAT believes in the need to develop students' reasoning skills continuously. When asked how they conducted post-competition reflection, the EAT stated that they had conducted reflection in activity evaluations. The EAT assessed that some students' reasoning skills were still lacking during environmental education activities, and there was also a tendency for them to remain closed to other discourses, so that when discussing extracurricular activities, their reasoning tended to stagnate. Based on these internal conversations, the agents' ability to reflect by questioning the dominant conditions prevailing in the school was clearly evident. The EAT highlights concern and anxiety for the environmental actions taken, as well as a willingness to review existing practices.

Meanwhile, SA's reflections relate to their experiences of involvement during the 40-DCfS program and their efforts to ensure environmental preservation and care become a habit in the future. SA has acknowledged that her awareness has steadily increased to the point where it has become a habit, at least for her. When asked how she overcomes misunderstandings, she has explained that discussions are a way to bridge differences and find solutions to emerging disagreements:

[...] The most memorable and interesting thing is discussing together. In discussions, we learn to have a shared perspective. So, with different people, we have to find the answer; we have to find a solution without misunderstanding or feelings of disagreement with each other [...] Some children do not understand what it means. So, we explained it again, and finally, after three times, they understood. (Interview, SA-1)

The SA's statement indicates that consolidation and collaboration are key to success. Discussion activities are one way to strengthen intimacy and mutual understanding. Furthermore, regarding the experience gained during the competition, it was stated that SA provided valuable experience in collaborating and building solidarity among peers:

I am happy that the children can collaborate well, and this feeling can increase solidarity among friends. So, for example, when we discuss or work in groups [...] Well, that also requires a high level of solidarity. Individuals will clash [...] without solidarity, so the children's solidarity is also very high. (Interview, SA-1)

It can be concluded that the SA strives to emphasize the importance of commitment, consistency, sensitivity, concrete action, collaboration, and a better life. Regarding their views on disasters such as the climate crisis, the SA believes that human factors are the primary cause. They have stated that the climate crisis cannot be predicted when it occurs or how to detect it, but there are several ways to address it. The SA's view of

sustainability is understood as a continuous and ongoing effort. For the SA, sustainability is defined as sustainable efforts towards a better life through lifestyle changes, which require consolidated efforts and collaboration as the key.

## **Silent Communication: A Connector for Internal and External Conversations**

Conversations between key school stakeholders occurred directly, face-to-face, and indirectly through WhatsApp Groups (WAGs). At least five WAGs were used during the competition, and there could have been more. An internal WAG specifically for SAs was created to allow for more flexible discussions without school representatives, such as the vice principal and teachers – meanwhile, the other two WAGs comprised teachers, PIA facilitators, and students. The researcher could not become a member of the SA WAG due to its highly specialized nature. However, the researcher managed to obtain a transcript of the conversation from one of the SAs to understand its content. From this dedicated WAG for SAs, the researcher gained valuable and interesting information, as it contained “silent” conversations that likely could not be captured through interviews or field notes. The WAGs revealed that the SAs experienced various dynamics during the competition, including complaints, protests, arguments, debates, insults, rebuttals, etc. In fact, it was reported that the WhatsApp group admin had changed the group name several times to “Babu Sekolah” or “Complaints about Being a School Servant”. The term “babu” in this context is used satirically to describe the feeling of being a student who is constantly being ordered and burdened with work, like a servant or informal worker.

When asked about these terms and expressions, several SAs were willing to express their opinions openly, while others tended to remain silent and smile when asked. SA-1 considered some student actions, such as cleaning and maintaining the school garden, to be the school gardener’s job. Meanwhile, SA-2 and SA-3 admitted to being influenced by some teasing from other students outside of the PLH extracurricular activities, who viewed them as mere errand boys or school servants. As one student put it:

[...] Initially, the kids thought, “Wow, we are cleaning the school.” [...] For example, things like the trash bank sometimes require many kids to weigh, process, and sort the trash, which requires much energy and feels like we are being ordered around. (Interview, SA)

This statement suggests that ongoing communication is distorted, ultimately giving rise to hidden conversations unknown to anyone other than the SA. In some conversations, it was revealed that SAs were forced to comply with orders to prepare and complete reports and could not refuse. Occasionally, some SAs also critically questioned changes to the concept from the initial idea agreed upon by the PST and EAT. In response, several SAs proposed a re-evaluation of the program’s implementation and contacted the PST to seek clarification on the conceptual changes:

[SA-1]: Yesterday, I discussed many evaluations. The core of the program introduced from the beginning differs from the program proposed for the first ten days. [SA-2]: Okay, right, so a more in-depth evaluation is needed, so do not forget to come, guys, because this is important. (Online chat, SA)

The chat also drew criticism from some SAs, who argued that some actions were just muscle work. There were even calls to protest the beach cleanup. However, these conversations ultimately fell through due to fear. Some of them said they would be scolded if they did not follow instructions:

[...] moving plants is just muscle work [...] Come on, tell your friends, is it better to cancel or postpone? I said yes [...] yes, please [...] I am scared, aaaaaaa, time to faint, bye everyone [...] 'Rek' [friends] who took the interview photos at the light park, send them, "diseneni" [scold] Mrs. Rini [PST's pseudonym] [...] please do not forget, Mrs. Rini is chasing me. (Online conversation)

Based on excerpts from these conversations, there is no single response, but rather quite a variety depending on how the specific situation and conditions are subjectively expressed. In this case, the students knew who they were dealing with – the PST and vice principal. Table 1 below provides an overview of the internal conversation process through the reflexive mode that occurs in climate change mitigation actions.

**Table 1**  
*Modes of Reflexivity of Environmental Agents in School-Based Climate Action*

| <b>Mode of Reflexivity</b>                      | <b>Promotional Interest Agent</b>                                                                     | <b>Program Supervising Teacher</b>                                                                     | <b>Extracurricular Assistant Teacher</b>                                                              | <b>Student Agents</b>                                                                                       | <b>Educational Implications</b>                                                                          |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Communicative reflexivity                       | Facilitates meetings, mentoring, and consultations that encourage dialogue among school actors.       | Translates external agendas into actionable school programs through negotiation and discussion.        | Facilitates student dialogue, reflection, and collaboration in environmental activities.              | Participates in group discussion, shared planning, and collective action.                                   | Strengthens intersubjective understanding and dialogic learning; fosters democratic participation.       |
| Autonomous reflexivity                          | Promotes the role of schools as climate actors aligned with SDGs and ESD goals.                       | Revitalizes environmental initiatives (e.g. Adiwiyata) and monitors program continuity.                | Encourages students' independent ideas, critical opinions, and leadership in sustainability projects. | Initiates small-scale yet continuous sustainability actions.                                                | Reinforces reflective autonomy, initiative, and co-agency between teachers and students.                 |
| Meta-reflexivity                                | Critically reviews routine or over-standardized actions to integrate innovation and social relevance. | Questions structural barriers (e.g., lack of leadership support) and advocates for broader engagement. | Reflects on pedagogical approaches and addresses hidden power relations or resistance in learning.    | Expresses critical awareness toward "greenwashing" and symbolic compliance.                                 | Builds critical environmental consciousness and reflexive ethics among school communities.               |
| Communicative Tensions ("Silent Communication") | Creates institutional and normative structures that may limit open interaction.                       | Enforces rules and expectations that indirectly shape student self-censorship.                         | Navigates relational and emotional dynamics that affect student expression.                           | Experiences "silent communication" as a form of hidden dialogue and reflection under hierarchical pressure. | Highlights the need for safe, inclusive, and dialogical spaces that enable voice and mutual recognition. |

Based on the concept of agency and the four modes of internal conversation borrowed from Archer, the summary in Table 1 shows that the outcomes of each environmental agent's reflexivity toward climate change mitigation actions are diverse and distributed among each environmental agent. First, communicative reflexivity is demonstrated by the agent's tendency and need to confirm the judgments of others before taking action. Second, autonomous reflexivity is more based on personal gain, such as instrumental success and superiority, which can maximize profits. Third, meta-reflexivity is characterized by critical conversations to evaluate and reflect on oneself before taking action, examining the outcomes of both one's own actions and those of others. However, this study has not found fractured reflexivity; instead, it has found a silent mode of communication, a conversation between internal and external that occurs exclusively among student agents and is unknown to anyone other than themselves. Silent communication captures the tacit, often unspoken, negotiation between internal reflexivity and external communicative influences. This includes students negotiating peer influence, teachers balancing administrative demands, and external partners mediating between global discourse and local practices.

## The Relationship Between World Realities, Interests, and Actions

This section explains how the communication actions of external and internal environmental agents relate to world realities, interests, and actions in implementing GAP for climate change mitigation in schools.

### *Instrumental Actions*

This section reveals how technical instrumental actions, such as guidelines, criteria, target controls, and performance, are influenced by theoretical interests through specific perspectives and approaches derived from external objective world realities, such as global agendas, goals, and framing. The relationships between these three are presented in Table 2.

**Table 2**

*Objective World Reality*

| Objective World Reality | Interest           | Action                           |
|-------------------------|--------------------|----------------------------------|
| <i>External</i>         | <i>Theoretical</i> | <i>Technical Instrumentalist</i> |
| Agenda                  | Perspective        | Guidelines                       |
| Objective               | Approach           | Criteria                         |
| Framing                 |                    | Control                          |
|                         |                    | Target                           |
|                         |                    | Performance                      |

Table 2 shows that the PIA uses cognitive objective reality in the form of the SDG agenda, specifically Goals 13 and 4, and ESD, which encompasses the social, economic, and environmental pillars, as the primary agenda to be implemented in educational settings, particularly in schools. The PIA aims to achieve this by examining how schools can contribute to implementing ESD, be environmentally responsible, and act as climate change drivers.

**Communicative Action**

This section explains how emancipatory communicative action, such as the ability to evaluate claims, openness, and equality, has been influenced by discursive processes, such as the ability to test claims toward understanding and consensus orientation, which originate from the intersubjective and normative-evaluative realities of the world, such as the assertion of truth claims and deliberation. These three relationships are presented in Table 3.

**Table 3**  
*Intersubjective World Reality*

| The Reality of the Intersubjective World | Interest                                    | Action                                   |
|------------------------------------------|---------------------------------------------|------------------------------------------|
| <i>Normative-Evaluative</i>              | <i>Discourse</i>                            | <i>Emancipatory-Communicative</i>        |
| Making a claim (truth) discussion        | Testing claims (understanding)<br>Consensus | Evaluating claims (openness)<br>Equality |

Table 3 shows that environmental agents use intersubjective reality, namely, reciprocal interaction and communication, to build mutual recognition, understanding, and agreement. In this communication, the PIA’s involvement is minimal; if any, it is more about providing consultation opportunities, particularly regarding the technical aspects of activity implementation. For example, after the initial selection results were announced, the PIA provided several notes to participants regarding suggestions for improvement, including greater attention to competition assessment criteria such as creativity, uniqueness, and program innovation.

**Strategic Actions**

This section explains how strategic actions that tend to influence, dominate, and distort are influenced by political interests, such as winning the competition, stemming from the internal world’s subjective and expressive realities. These three relationships are presented in Table 4.

**Table 4***Subjective World Reality*

| <b>Subjective World Reality</b> | <b>Interest</b>  | <b>Action</b>    |
|---------------------------------|------------------|------------------|
| <i>Internal</i>                 | <i>Political</i> | <i>Strategic</i> |
| Expressive                      | Success          | Influence        |
| Construction                    |                  | Dominance        |
| Silent communication            |                  | Distortion       |

Table 4 shows that environmental agents utilize subjective reality because it involves expressing individual emotions and interests. Strategic actions create opportunities for domination over other agents, resulting in systematically distorted communication, which can be overt or covert. Meanwhile, agents use logical reasoning only to achieve goals or consequences that lead to success. In the process, strategic actions allow for reciprocal influence and intervention in reaching agreements. Language can potentially be used solely as a tool by actors to achieve their goals, such as the hope of winning a competition, rather than based on understanding and mutual comprehension.

Table 5 presents the relationship between world reality, interests, and action to help explain the three structural components of life outlined by Habermas, including cognitive cultural reproduction, social-interactive integration, and expressive socialization in the Climate Change Gap in schools.

**Table 5***Relationship Between World Reality, Interests, and Action*

| <b>World Reality</b> | <b>Interest</b>    | <b>Action</b>                     |
|----------------------|--------------------|-----------------------------------|
| <i>External</i>      | <i>Theoretical</i> | <i>Technical instrumentalist</i>  |
| Agenda               | Perspective        | Guidelines                        |
| Objective            | Criteria           | Target                            |
| Standard             | Control            | Performance                       |
| <i>Normative</i>     | <i>Discourse</i>   | <i>Emancipatory-Communicative</i> |
| Claim of Validity    | Comprehension      | Openness                          |
| Deliberation         | Consensus          | Equality                          |
| Filing a Claim       | Testing the Claims | Evaluating Claims                 |
| <i>Internal</i>      | <i>Political</i>   | <i>Strategic</i>                  |
| Expressive           | Achievement        | Influence                         |
| Construction         | Discourse          | Domination                        |
| Silent Communication | Control            | Distortion                        |

Based on Table 5, the relationship between the three realities of the world –objective external reality, intersubjective normative reality, and subjective internal reality – has given rise to the characteristics of their respective interests. Theoretical interests are manifested in the perspectives used; discourse is oriented towards understanding, agreement, and consensus, while political interests are oriented towards success and achievement in the form of discourse control and attainment, and this, in turn, gives rise to various actions. Instrumental technical actions are supported by guidelines, targets, and performance plans; while emancipatory-communicative actions aim to achieve understanding and empowerment through processes of openness, equality, and claims of validity; and strategic actions are influenced by domination and distortion. Meanwhile, silent communication emphasizes how messages and meanings are constructed and understood tacitly through media such as WhatsApp. Silent communication can be interpreted as part of communicative action, but also indicates limitations or obstacles to emancipatory discourse.

## Discussion

In implementing the 40-DCfS climate action competition, it is undeniable that schools need to achieve success. Therefore, schools often require instrumental actions to help achieve their desired goals. Even the absence of success-oriented instrumental action can sometimes diminish motivation and make it difficult for agents to take environmental action. Winning competitions can be a source of motivation for environmental agents in schools. However, ignoring students' understanding, voices, and expectations can lead to coercion, especially when accompanied by pressure and domination. Environmental agents implementing climate action in schools have demonstrated reflexivity. Findings indicate the emergence of communicative reflexivity, autonomous reflexivity, and meta-reflexivity, but no fractured reflexivity has been found. This study instead has found a mode of conversation or silent communication. This conversation occurs exclusively among students and is unknown to anyone other than the students. Therefore, the reality of the subjective world without the facilitation of intersubjective reality will only result in hidden forms of communication.

Recognizing silent communication is crucial to understanding the reflexivity of environmental agents in developing awareness and building will, and translating this into environmental action, including action to address climate change. Students' lack of understanding in implementing the climate change GAP in schools can create barriers, leading to silent communication among them. As Archer (2002) argues, the distinction between objectivity and subjectivity, or the structures that objectively condition agency and action, cannot resolve the issue of mediation and thus requires reflexive consideration by social agents. Silent communication represents unspoken, implicit, non-verbal communication, even in symbols and gestures. There has been a shift in how messages and meanings are constructed and understood tacitly through digital media such as WhatsApp. Adefila et al. (2021) assess that digital resources can support the democratization of knowledge production and increase equal participation.

In the context of this research, silent communication can be positioned as a bridge

or link between internal and external conversations expressed by environmental agents in climate action. This term can enrich the perspective of Archer's reflexivity mode and Habermas's theory of communicative action, where "silence" does not imply the absence of intra-action and inter-action. Although Habermas did not use the term "silent communication" in his theory of communicative action, this term can be positioned as an emerging concept that expands and elaborates on Habermas's framework. Functionally, silent communication can be instrumental, communicative, and even strategic. The messages conveyed have intersubjective meanings, conveying agreement, commitment, doubt, protest, and even silent rejection.

In light of school engagement in climate action, offline and online communication can be strategic spaces for recognition, dialogue, and discussion within socio-ecological action. Students can construct their identities as knowledge consumers and producers amidst limiting and empowering conditions. Silent communication can be a powerful tool for shaping group dynamics, influencing decision-making, and strengthening or challenging the dominance of certain voices. From Archer's (2003) framework, silent communication reflects a mode of communicative reflexivity in which individuals rely on shared understandings of the discussed climate action. This also aligns with Habermas's perspective on the lifeworld, which is oriented toward social integration and mutual understanding. This effort aligns with various studies that promote an open and democratic school climate conducive to active participation (Schulz et al., 2018), facilitate student engagement in environmental activism (Reis, 2020), and encourage participatory processes in the co-production of knowledge between experts and citizens (Smederevac-Lalic et al., 2020), strengthening the pedagogical potential of ESD by linking critical reflection with collaborative action (Salite et al., 2020).

However, the strategic use of silent communication also risks creating uncertainty and triggering misunderstandings. Strategic action occurs when language functions less as a medium for mutual understanding and more as an instrument for achieving specific outcomes, such as winning competitions and gaining admission to prestigious schools. Selective information sharing, focusing on particular perspectives, and persuasive framing, such as persuading and seducing, can undermine the creation of communicative rationality. The interplay between silent communication and strategic action can reveal tensions and underscore the need for reflexive agents who can navigate the gap between communication that maintains harmony and fosters critical engagement. Understanding these two dynamics for school environmental education is crucial for building collaborative partnerships that minimize distortion and domination. This demonstrates the crucial relationship between reflexivity and collectivity (Nairn, 2019). In this context, reflexivity has been considered in social and material relationships and attachments and in building sustainable communities (Allen, 2015; Casey et al., 2017).

Climate action designed and implemented in schools must prioritize shared understanding and responsibility, accompanied by critical reflection, rather than simply pursuing achievement. Individuals willing and able to engage in reflexive relationships and responsible actions toward a sustainable society must recognize priorities, concerns, and actions by changing their routines (Golob & Makarovič, 2022). Actors' propensity to critically reflect on their internal conversations and social actions can be crucial for

future socio-ecological transformation processes. Meta-reflexivity refers to a critical re-evaluation of one's inner dialogue and social environment and involves attention beyond individual success, potentially transcending existing narratives, ideologies, rules, and affiliations (Golob & Makarovič, 2022). Nastar (2023) similarly argues that meta-reflexivity is an ideal type of reflexivity in sustainability research, including climate change issues, because it allows researchers to be critical of methodological choices and challenge dominant assumptions about how sustainability research should be conducted.

When students are exposed to diverse perspectives and multiple considerations, Archer (2012) sees this as a crucial reflexive process for young people in emergent situations. Archer's framework explains how reflexivity shapes individual agency in prioritizing and addressing emerging issues. This is relevant to Stein's (2019) view of the need for internal conversations for practitioners seeking ways to engage young people in complex planning processes and envision their futures. Kohl and Hopkins (2022) education strategies and funding were negatively impacted and, consequently, especially vulnerable groups were highly affected, amongst them Indigenous communities around the world. As Indigenous communities were already amongst the most vulnerable before 2020, a strategically and well-planned recovery from this pandemic would be vital to secure their well-being. This article offers reflections on the potential of infusing Education for Sustainable Development in classrooms, schools, and communities. Meanwhile, Beilharz and Habermas's (2000) framework outlines how communicative rationality supports achieving shared understanding, facilitating consensus and cooperation in environmental action. Therefore, combining these two frameworks in school-based environmental sustainability and climate change education can offer new analytical perspectives for understanding the mediating role of reflexivity and intersubjective communication in environmental agency.

This integrated framework can be adapted to broader educational contexts, serving as a tool for teacher educators, school leaders, and policymakers to enhance reflexive capacity and foster communicative skills in initiating sustainable educational and socio-ecological transformations. Bernárdez-Gómez et al. (2024), as educators, have a responsibility to foster education that promotes sustainable development, ensuring that new generations adopt practices and values that contribute to building a more equitable and sustainable future. The goal of this article is to provide an overview of the actions and experiences related to the SDGs that are being carried out at schools in the Autonomous Community of the Region of Murcia (Spain underscore the importance of schools as key agents in promoting sustainable development and preparing students to face global challenges. Many studies have utilized youth's hopes to manage fear and uncertainty in the face of climate change (Sandford, 2022). For Ojala (2017), hope is a crucial component of agency and suggests that critical and semi-realistic expectations can pave the way for action. Sandford (2022) views youth's hopes and expectations as crucial ideas about the future and linked to action in the present. Therefore, educators must work constructively to address youth's anxiety and hope in developing their capacity to act in the face of climate uncertainty (Ojala, 2016).

Discussions on reflexivity are crucial for effective sustainability research because they can determine how social and ecological issues should be framed and what

solutions should be prioritized to address sustainability challenges (Wittmayer & Schöpke, 2014). Reflexivity also helps sustainability researchers become more aware of the values, worldviews, and power relations that shape their ways of knowing and conducting research (Staffa et al., 2022). This is relevant to several other studies that suggest promoting subjectification processes in schools while learning to compromise and negotiate (Biesta, 2020), encouraging discussions about climate change through dialogue (Swim et al., 2018), inspiring students to participate in arguments, debates, and decision-making related to climate change (Dawson & Carson, 2017), and encouraging students to become active participants rather than passive observers (Jurs & Špehte, 2021).

This study contributes to sustainability pedagogy by demonstrating how schools can function as reflective and communicative engagement platforms. Integrating Archer's reflexivity and Habermas's communicative action for school climate action provides a means by which environmental agents internalize values through reflection, which are then actualized in collective action. The emergence of silent communication that bridges internal reflection and external influences highlights the pedagogical potential of schools in addressing the ongoing limitations of ESD when technical and structural priorities overshadow pedagogical issues. It is important to consider how subjective and intersubjective interactions can be simultaneously accommodated. Through this effort, it is hoped that schools will have the opportunity to revise the implementation of climate change education to empower environmental agents better.

## Conclusion

In climate action, school environmental agents act as program implementers and reflective subjects, actively interpreting, negotiating, and questioning the conditioning of existing sociocultural structures. The relationship between teacher and student interactions can be facilitated and constrained within a micro-sociological context. Both can interact dynamically, sometimes dominating, interdependent, connected, disconnected, and connected and disconnected again. Utilizing Archer's framework of reflexivity and Habermas's communicative action, this study reveals how silent communication in digital chat rooms like WhatsApp can become a space for articulating environmental agency in addressing climate change issues. The existence of silent communication has connected internal reflection with external dialogue, acting as a bridge between personal agency and collective action. Integrating reflexivity and communicative modes of action can be an alternative way to empower environmental agents toward school-based sustainable environmental education. It is recommended to consider how intra-action and inter-action can be simultaneously accommodated in climate change action.

## References

Adefila, A., Arrobbio, O., Brown, G., Robinson, Z., Spolander, G., Soliev, I., & Wimpenny, K. (2021). Ecologized collaborative online international learning: Tackling wicked

- sustainability problems through education for sustainable development. *Journal of Teacher Education for Sustainability*, 23(1), 41–57. <https://doi.org/10.2478/jtes-2021-0004>
- Allen, S. (2015). Reflexivity for sustainability: Appreciating entanglement and becoming relationally reflexive. *International Journal of Work Innovation*, 1(2), 240–250. <https://doi.org/10.1504/IJWI.2015.071191>
- Archer, M. (2002). Realism and the problem of agency. *Alethia*, 5(1), 11–20. <https://doi.org/10.1558/aleth.v5i1.11>
- Archer, M. S. (2003). Structure, agency and the internal conversation. Cambridge University Press.
- Archer, M. S. (2012). The reflexive imperative in late modernity. Cambridge University Press. <https://doi.org/10.1017/CBO9781139108058>
- Beilharz, P., & Habermas, J. (2000). On the pragmatics of communication. *Contemporary Sociology*, 29(5), 758–759. <https://doi.org/10.2307/2655274>
- Bernárdez-Gómez, A., Martínez, M. J. B., González-Barea, E. M., & Rodríguez-Entrena, M. J. (2024). How are the Sustainable Development Goals being worked within the schools? *Journal of Teacher Education for Sustainability*, 26(2), 162–193. <https://doi.org/10.2478/jtes-2024-0021>
- Biesta, G. (2020). Risking ourselves in education: Qualification, socialization, and subjectification revisited. *Educational Theory*, 70(1). <https://doi.org/10.1111/edth.12411>
- Burkitt, I. (2016). Relational agency: Relational sociology, agency and interaction. *European Journal of Social Theory*, 19(3), 322–339. <https://doi.org/10.1177/1368431015591426>
- Caetano, A. (2014). Reflexivity and social change: A critical discussion of reflexive modernization and individualization theses. *Portuguese Journal of Social Science*, 13(1), 93–109. [https://doi.org/10.1386/pjss.13.1.93\\_1xs](https://doi.org/10.1386/pjss.13.1.93_1xs)
- Carspecken, F. P. (2020). Stage two: Preliminary reconstructive analysis. In N. K. Denzin & Y. S. Lincoln (Eds.), *Critical ethnography in educational research* (pp. 93–120). <https://doi.org/10.4324/9781315021263-13>
- Casey, K., Lichrou, M., & O'Malley, L. (2017). Unveiling everyday reflexivity tactics in a sustainable community. *Journal of Macromarketing*, 37(3), 227–239. <https://doi.org/10.1177/0276146716674051>
- Chen, M.-J., Guo, C.-Y., & Tang, C. W. (2022). Monitoring learning-oriented school education: Indicator construction and their application. *Studies in Educational Evaluation*, 73, 101142. <https://doi.org/10.1016/J.STUEDUC.2022.101142>
- Dawson, V., & Carson, K. (2017). Using climate change scenarios to assess high school students' argumentation skills. *Research in Science and Technological Education*, 35(1), 1–16. <https://doi.org/10.1080/02635143.2016.1174932>
- Dunlop, L., & Rushton, E. A. C. (2022). Education for environmental sustainability and the emotions: Implications for educational practice. *Sustainability*, 14(8), 4441. <https://doi.org/10.3390/su1408444>
- Golob, T., & Makarovič, M. (2022). Meta-reflexivity as a way toward responsible and sustainable behavior. *Sustainability*, 14(9), 5192. <https://doi.org/10.3390/>

su14095192

- Habermas, J. (1985). *The theory of communicative action: Reason and the rationalization of society*. Beacon press.
- Haugseth, J. F., & Smepllass, E. (2023). The Greta Thunberg effect: A study of Norwegian youth's reflexivity on climate change. *Sociology*, 57(4), 921–939. <https://doi.org/10.1177/00380385221122416>
- Hillen, S. A. (2020). School staff-centered school development by communicative action: Working methods for creating collective responsibility-from the idea to action. *Journal on Efficiency and Responsibility in Education and Science*, 13(4), 183–203. <https://doi.org/10.7160/ERIESJ.2020.130403>
- Jickling, B., & Wals, A. E. J. (2012). Debating Education for Sustainable Development 20 years after Rio: A conversation between Bob Jickling and Arjen Wals. *Journal of Education for Sustainable Development*, 6(1), 49–57. <https://doi.org/10.1177/097340821100600111>
- Jurs, P., & Špehte, E. (2021). The role of feedback in the distance learning process. *Journal of Teacher Education for Sustainability*, 23(2), 91–105. <https://doi.org/10.2478/jtes-2021-0019>
- Kohl, K., & Hopkins, C. (2022). Reflections of good practice of infusing ESD to improve education outcomes for indigenous learners in light of a global pandemic. *Journal of Teacher Education for Sustainability*, 24(2), 99–112. <https://doi.org/10.2478/jtes-2022-0019>
- Kohn, L. (2001). A critical ethnography of the professional community in a restructured school: Recognizing diverse views. *Studies in Educational Ethnography*, 5, 119–152. [https://doi.org/10.1016/s1529-210x\(01\)80007-3](https://doi.org/10.1016/s1529-210x(01)80007-3)
- Kopnina, H. (2020). Education for the future? Critical evaluation of education for sustainable development goals. *Journal of Environmental Education*, 51(4), 280–291. <https://doi.org/10.1080/00958964.2019.1710444>
- Kusnadi, K., & Ayu, S. N. (2024). Behind the concept of “Zero Carbon Emissions” in Indonesia: A symbolic construction analysis. *Journal La Sociale*, 5(1), 74–83. <https://doi.org/10.37899/journal-la-sociale.v5i1.925>
- Mensah, J. (2019). Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review. *Cogent Social Sciences*, 5(1), 1653531. <https://doi.org/10.1080/23311886.2019.1653531>
- Nairn, K. (2019). Learning from young people engaged in climate activism: The potential of collectivizing despair and hope. *Young*, 27(5), 435–450. <https://doi.org/10.1177/1103308818817603>
- Nastar, M. (2023). A critical realist approach to reflexivity in sustainability research. *Sustainability*, 15(3), 2685. <https://doi.org/10.3390/su15032685>
- Ojala, M. (2016). Preparing children for the emotional challenges of climate change: A review of the research. In K. Winograd (Ed.), *Education in times of environmental crises: Teaching children to be agents of change* (pp. 9–13). <https://doi.org/10.4324/9781315671970>
- Ojala, M. (2017). Hope and anticipation in education for a sustainable future. *Futures*, 94, 76–84. <https://doi.org/10.1016/j.futures.2016.10.004>

- Parry, S., & Metzger, E. (2023). Barriers to learning for sustainability: A teacher perspective. *Sustainable Earth Reviews*, 6(1), 2–11. <https://doi.org/10.1186/s42055-022-00050-3>
- Reis, P. (2020). Environmental citizenship and youth activism. In A. Hadjichambis, P. Reis, D. Goldman, & O. Paraskeva-Hadjichambi (Eds.), *Conceptualizing environmental citizenship for 21st century education* (pp. 139–148). Springer International Publishing. <https://doi.org/10.1007/978-3-030-20249-1>
- Salite, I., Briede, L., Drelinga, E., & Ivanova, O. (2020). The false self from the pedagogical perspective. *Journal of Teacher Education for Sustainability*, 23(2), 143–157. <https://doi.org/10.2478/jtes-2021-0022>
- Sandford, R. (2022). *Ideas of the future and their place in young people's internal conversation*. [Doctoral Dissertation, University of Bristol].
- Sato, M., & Kitamura, Y. (2023). Current status of climate change education and suggestions for its integrative development in Japan. *IATSS Research* 47(2), 263–269. <https://doi.org/10.1016/j.iatssr.2023.04.002>
- Schoop, M. (2021). Negotiation communication revisited. *Central European Journal of Operations Research*, 29(1), 163–176. <https://doi.org/10.1007/s10100-020-00730-5>
- Schulz, W., Ainley, J., Fraillon, J., Losito, B., Agrusti, G., & Friedman, T. (2018). *Becoming citizens in a changing world: IEA international civic and citizenship education study 2016 international report*. Springer Nature. <https://doi.org/10.1007/978-3-319-73963-2>
- Sinakou, E., Boeve-de Pauw, J., & Van Petegem, P. (2019). Exploring the concept of sustainable development within education for sustainable development: Implications for ESD research and practice. *Environment, Development and Sustainability*, 21, 1–10. <https://doi.org/10.1007/s10668-017-0032-8>
- Sinakou, E., Boeve-de Pauw, J., Goossens, M., & Van Petegem, P. (2018). Academics in the field of Education for Sustainable Development: Their conceptions of sustainable development. *Journal of Cleaner Production*, 184(1), 321–332. <https://doi.org/10.1016/j.jclepro.2018.02.279>
- Smederevac-Lalic, M., Finger, D., Kovách, I., Lenhardt, M., Petrovic, J., Djikanovic, V., Conti, D., & Boeve-de Pauw, J. (2020). *Knowledge and environmental citizenship*. In A. Hadjichambis, P. Reis, D. Goldman, & O. Paraskeva-Hadjichambi (Eds.), *Conceptualizing environmental citizenship for 21st century education* (pp. 69–82). Cham.
- Staffa, R. K., Riechers, M., & Martín-López, B. (2022). A feminist ethos for caring knowledge production in transdisciplinary sustainability science. *Sustainability Science*, 17(1), 45–63. <https://doi.org/10.1007/s11625-021-01064-0>
- Stein, M. (2019). Supporting young people from care to adulthood: International practice. *Child and Family Social Work*, 24(3), 400–405. <https://doi.org/10.1111/cfs.12473>
- Suhaeb, F. W., Tamrin, S., Jumadi, & Irwan. (2024). Community adaptation strategies to climate change: Towards sustainable social development. *Migration Letters*, 21(S2), 943–953. <https://migrationletters.com/index.php/ml/article/view/7017>
- Swim, J. K., Geiger, N., Sweetland, J., & Fraser, J. (2018). Social construction of scientifically grounded climate change discussions. *Psychology and Climate Change: Human Perceptions, Impacts, and Responses*, 65–93. <https://doi.org/10.1016/B978-0-12->

813130-5.00004-7

- Thomas, J. (2011). *Doing critical ethnography*. Sage.
- Wibowo, N. A., Sumarmi, S., Utaya, S., Bachri, S., & Kodama, Y. (2023). Students' environmental care attitude: A study at Adiwiyata Public High School based on the New Ecological Paradigm (NEP). *Sustainability*, 15(11), 8651. <https://doi.org/10.3390/su15118651>
- Wijesooriya, N., & Brambilla, A. (2021). Bridging biophilic design and environmentally sustainable design: A critical review. *Journal of Cleaner Production*, 283, 124591. <https://doi.org/10.1016/j.jclepro.2020.124591>
- Wittmayer, J. M., & Schöpke, N. (2014). Action, research and participation: Roles of researchers in sustainability transitions. *Sustainability Science*, 9(4), 483–496. <https://doi.org/10.1007/s11625-014-0258-4>
- Zandvliet, D. B., & Paul, A. (2023). Social ecology and environmental diversity in teacher education. *Journal of Teacher Education for Sustainability*, 25(1), 168–181. <https://doi.org/10.2478/jtes-2023-0011>

Correspondence concerning this paper should be addressed to Ganes Gunansyah, Universitas Negeri Surabaya, Surabaya, Indonesia. Email: [ganesgunansyah@unesa.ac.id](mailto:ganesgunansyah@unesa.ac.id)