



# Smithsonian Science Education Center

## Network for Socio-Scientific Thinking Contextualization for Researchers

Note: The contextualization below is just one example what these terms could mean for researchers; it does not represent the experiences of all.

Key Terms		Context
Term	Definition	What does this mean for . . . /Why is this term important to . . . ?
<b>Complexity Theory</b>	Complexity theory tries to explain and understand how and why interactions between objects and systems develop and change, as well as the influence these relationships have on objects and systems which initially appear to have no connection to the primary relationship being observed.	<a href="#">Socio-scientific issues</a> are complex, so our research methods must be equally complex or sensitive to capturing that complexity. Learning about complexity theory offers us shifts in worldview that are going to help us to create those more complex entry points for our research. A foundation in complexity theory helps us remember how research fits within the context of the whole issue. It helps us understand where and how appropriate boundaries for a research project or questions should be set—we recognize no one person can work on the issue as a whole, but also the costs of reducing the problem down to isolated aspects. Complexity theory helps us learn where the point of balance is.

Glossary compiled by Smithsonian Science Education Center's Network for Socio-Scientific Thinking (NESST)

Suggested Citation: "Insert Term Cited"(2023). *Network for Socio-Scientific Thinking Glossary: Contextualization for Researchers*.

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<b>Emergence</b>	<p>Emergence refers to the phenomena of a new or unique behavior or dynamic arising from the interaction of two objects or systems which does not occur otherwise. Emergence is surprising and <a href="#">complex</a> because this new characteristic is not present in the individual object/systems separately.</p> <p><i>Examples: cultural gestures like the handshake, wicked problems like climate change, or questions of existence, like human consciousness</i></p>	<p>If you study something that happens as a result of two things interacting, you may be studying an emergent property. Because emergent properties are novel, they allow us many opportunities for investigation. Understanding the field of emergence may help give you new perspective or insight into your specific topic of research or allow you to transfer knowledge or methods used in investigating other emergent properties to your work.</p>
<b>Global Citizenship Education (GCED)</b>	<p>GCED frames learning in a way to encourage a sense of global and local belonging and awareness of the world's <a href="#">complexity</a> and interconnectedness and collective, inclusive action-taking for a just, peaceful, and sustainable future.</p>	<p>Researchers can use GCED to help them think about how research and learning impact the whole person, as well as society across regions and generations. GCED frameworks can also be used as support when designing outreach portions of proposals.</p>
<b>Scientific Literacy</b>	<p>Scientific literacy means having a solid grasp of scientific ideas and how they apply to real-life situations. It involves understanding scientific facts, thinking critically about scientific claims, and using evidence to make informed choices. Being scientifically literate helps you appreciate science and make sense of the world around you.</p> <p><i>Examples: Using data to make informed choices about health/environmental/technological decisions</i></p>	<p>Scientific literacy to researchers means understanding and studying the process of acquiring scientific knowledge, skills, and attitudes in educational settings. It involves investigating effective teaching strategies, curriculum design, and assessment methods to foster scientific literacy among students. Researchers aim to enhance science education practices and improve scientific literacy outcomes for learners.</p>

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<b>Social Justice</b>	<p>Social justice means ensuring fairness and equality for all members of society. It involves addressing and correcting systemic inequalities and discrimination based on factors like race, gender, socioeconomic status, and more. Social justice aims to create a society where everyone has equal access to opportunities, resources, and rights, promoting a just and inclusive community.</p> <p><i>Examples: healthcare equity, criminal justice reform, access to education</i></p>	<p>To researchers, social justice means investigating and understanding the impact of educational practices, policies, and systems on marginalized communities. It involves uncovering inequalities, identifying barriers to equitable education, and generating evidence-based solutions that promote fairness, inclusion, and equal opportunities for all learners, irrespective of their backgrounds or identities. Researchers also have the responsibility to engage in ethical research practices that support and integrate social justice principles.</p>
<b>Socio-scientific Issues</b>	<p>Socio-scientific issues (SSI) are topics which bring science together with other fields, often to respond to a moral or ethical dilemma. These issues require an understanding of science/scientific skills in order to engage with them in an informed way and better support community decision-making and societal values around the topic.</p> <p><i>Examples: climate change, genetic engineering, animal testing, and vaccination policies</i></p>	<p>Socio-scientific issues encourage researchers to integrate multiple disciplinary perspectives, research methods, and ways of knowing into their work. It also emphasizes that research can contribute towards the social good, if academia chooses to contextualize work in society and engage with ethical dilemmas.</p>

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<b>Student Action-taking</b>	<p>Student action-taking refers to the ability of students to intentionally generate action for themselves and their community based on what they have experienced and learned. Action-taking increases students' sense of agency, and continued action-taking helps students move from simply executing actions to putting considered actions into place.</p> <p><i>Examples of places for student action-taking: school projects, volunteering, extra-curriculars, personal goal-setting, convincing family members to make alternative lifestyle choices</i></p>	<p>Student action-taking can become a valuable method used to co-create research with youth (Youth Participatory Action Research is an example), as well as a way to transfer research knowledge or skills from academia to the broader public.</p>
<b>Transdisciplinary Learning</b>	<p>Transdisciplinary learning utilizes real-life contexts, situations, and problems as the entry point for learning, and asks students to draw on tools, skills, and ways of knowing from multiple disciplines and cultures. In this way, students learn how to transfer skills and knowledge systems to any situation they encounter, regardless of how that topic is framed in traditional education.</p> <p><i>Examples: Climate Change Education, Social Justice Education</i></p>	<p>Transdisciplinary learning in research involves collaboration among experts from different fields who work together to understand problems and develop solutions that are more comprehensive, innovative, and effective than those that could be achieved within a single discipline.</p>

Want to know more? Find out what each term means in the context of the following roles:

[NESST Members](#)

[Educators](#)

[Youth](#)

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