

History of Socio-Scientific Issues (SSI), main themes, and current state of the research and practice

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Before SSI

- By late 1970s, the **Science-Technology-Society (STS)** established
 - Knowledge as socially constructed
 - Student-oriented
 - Emphasizes science facts and skills in social and technological contexts
- 1982 NSTA position paper: Scientific literacy requires understanding of the connections and interdependency of science, technology and society.
 - Roy (1984): STS as Megatrend in science education

STS Became Many Things...

- College courses
- Curricular units
- Organizing principles for content units
 - Ancillary text boxes in textbooks

In Mid 1980s, Science Educators had begun...

- Applying moral development & reasoning frameworks
 - Exploring ethics in science
- Suggesting moral & ethical issues in the curriculum

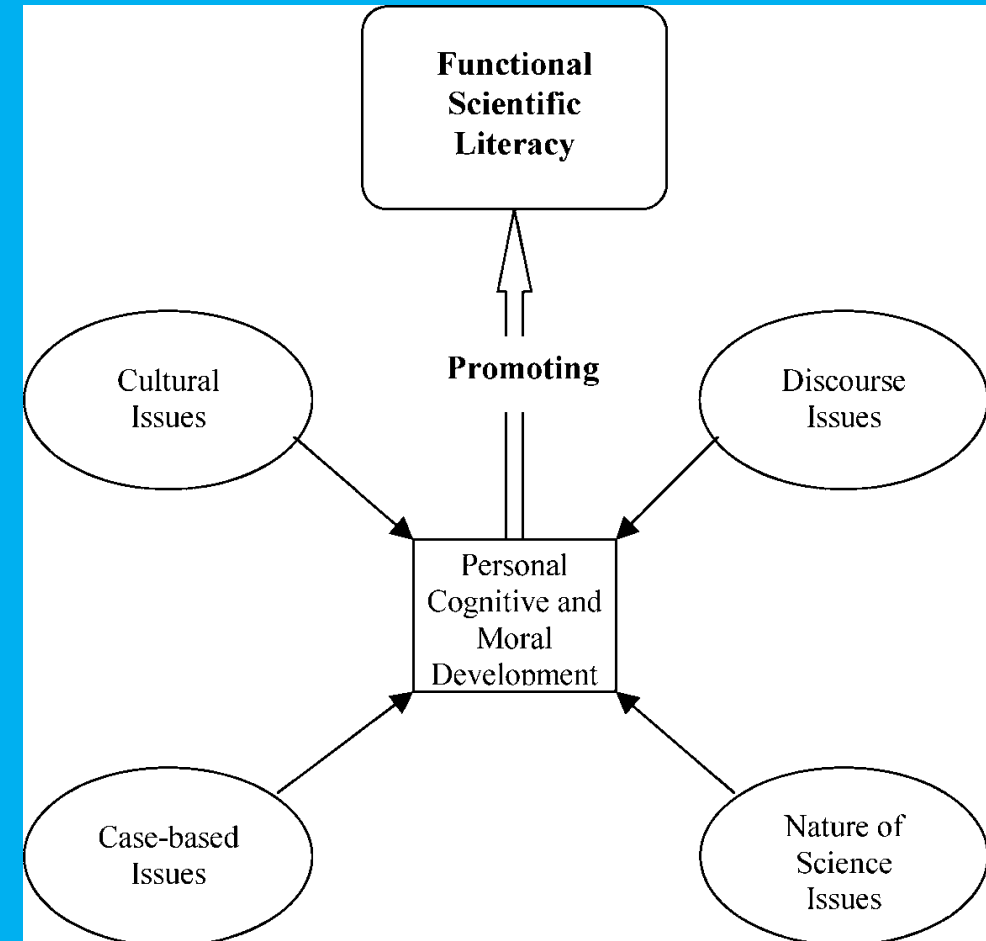
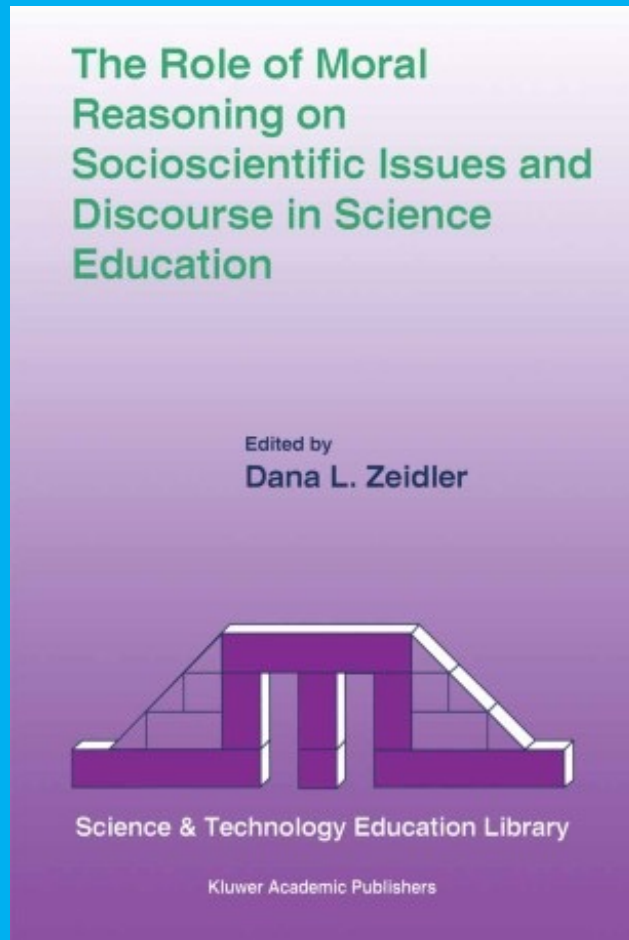
Introduction of “Socio-Scientific Issues” in Science Education Research

- Reg Fleming, 1986
- Adolescent reasoning in socio-scientific issues. Par I: Social cognition
 - Adolescent reasoning in socio-scientific issues. Par I: Nonsocial cognition

By the late 1990s...

- Significant critiques of STS (e.g., Shamos, 1995)
- “The fundamental purposes of STS education are genuinely and properly diverse and incoherent” (Ziman, 1994, p. 22).
- Zeidler drawing connections between moral reasoning, nature of science, teaching with controversial issues

2003: *The Role of Moral Reasoning on Socioscientific Issues and Discourse in Science Education*



Key factors in defining the SSI agenda

- Empower student decision-making
- Consideration of ethical dimensions
 - Facilitated through discourse
- Facilitates cognitive and moral development

What do you see as the most important aspects of SSI teaching and learning (not necessarily from this list)?

Over the last two decades, there have been multiple waves of research

- 1) Student learning and reasoning about SSI
- 2) Teacher perspectives on SSI
- 3) Classroom models

Student learning & Reasoning about SSI

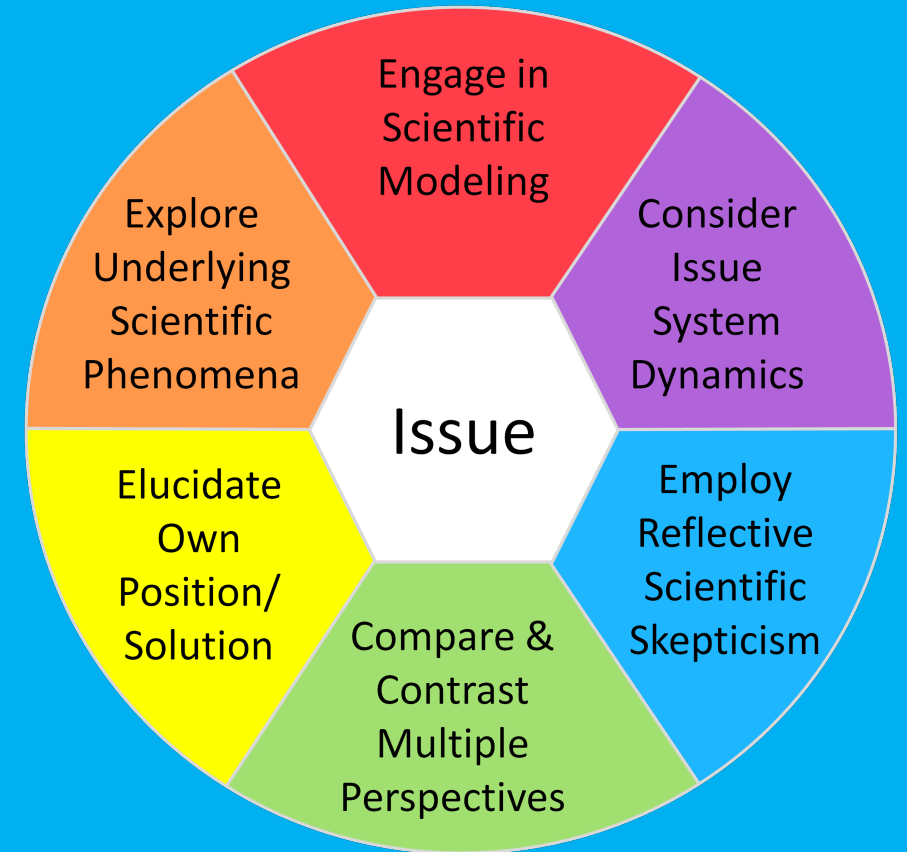
- How do students make sense of SSI?
- What ideas and sources of information do students rely on when considering SSI?
 - How does NOS relate to reasoning about SSI?
- How do students engage in argumentation related to SSI?

Teacher Perspectives on SSI

- Place of SSI in the curriculum
- Comparing SSI to other forms of science teaching
 - Challenges & constraints for using SSI
- Knowledge, skills, and practices necessary for teaching SSI

Classroom Models

- Creation & testing of models for
 - SSI curriculum
 - SSI assessments
 - SSI implementations
- Exploring connections between SSI Implementations and student outcomes



<https://epiclearning.web.unc.edu/>

Important Findings—Students

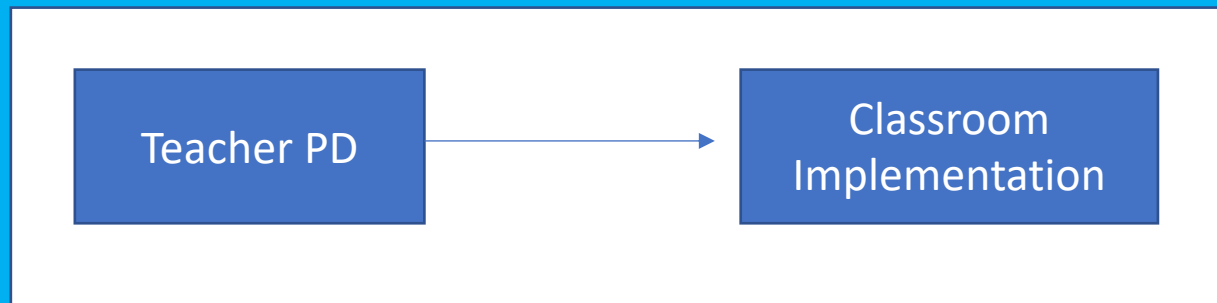
- Students rely on wide range of ideas and experiences as they reason about SSI. They often do not prioritize science ideas and practices.
 - SSI learning environments can support student learning of
 - Science content
 - Ideas about the nature of science
 - Reasoning skills
 - Science practices (e.g., argumentation & modeling)

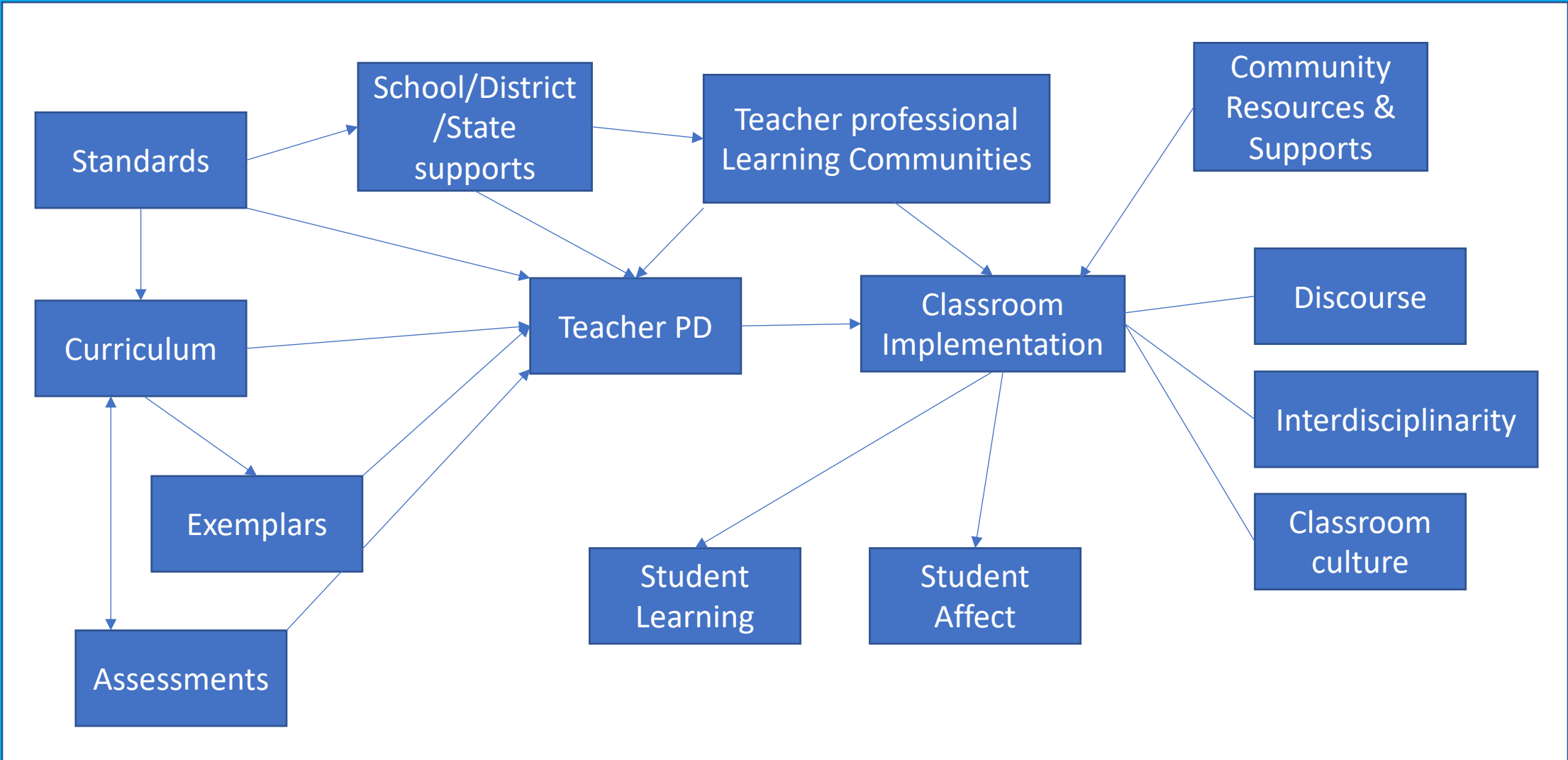
Important Findings--Teachers

- Most science teachers support the idea of teaching with SSI
 - Challenges to SSI teaching
 - Lack of alignment to standards & assessments
 - Questions about how to assess in classrooms
 - Not enough good curriculum
 - Time to plan; time to implement
 - Concerns about controversial conversations

Where is the field heading?

- Teacher supports for addressing implementation challenges.
- Technologies for creating innovative learning (and assessment) environments
- Addressing systems as opposed to pieces





What are the most important research questions related to SSI that should be pursued?

Exploring intersections of SSI and the new media environment

- Media studies & science journalism
 - Representation of science in popular media & entertainment (Barnett et al., 2006)
 - Accuracy of reporting in science media (e.g., Brossard & Scheufele, 2013)
 - Prominence of internet and social media as information sources (Gallup, 2018)
 - Point/Counterpoint presentation of scientific information (e.g., climate change; Grimes, 2019)

Exploring intersections of SSI and the new media environment—Where to next?

- How to help science teachers incorporate media & information literacy into science learning experiences?
- What strategies can students use to navigate a complicated media environment?
 - How do students engage in media creation for SSI?

How should we advance work at the intersection of SSI and the new media environment?