

**DANIEL P. SHEPARDSON**  
**CURRICULUM VITA**  
(1/18/2022)

**A. GENERAL INFORMATION**

1. Personal Data

Daniel Philip Shepardson  
32 Scarborough Ct.  
Lafayette, IN 47905  
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Personal website: <http://www.edci.purdue.edu/shepardson/>

Visualizing Nature website: <http://www.eaps.purdue.edu/research/visualizingnature/index.html>

2. Academic Record

a. Institutions Attended

Doctor of Philosophy in Science Education (1990)  
The University of Iowa, Iowa City, IA 52242  
(Science Education, Environmental Studies)

Masters of Education in Secondary Education (1984)  
Utah State University, Logan, UT 84322  
(Secondary Education, Biology)

Bachelors of Science in Wildlife Science (1980)  
Utah State University, Logan, UT 84322  
(Wildlife Science)

b. Academic Appointments

**Professor of Geoenvironmental and Science Education (8/02-Present)**

**Joint Appointment in the Department EAPS (2003-Present)**

Associate Professor of Science Education (7/95-8/02)  
Courtesy Appointment in the Department of Earth and Atmospheric Sciences (1999-2003)  
Assistant Professor of Science Education (8/90-6/95)  
Department of Curriculum and Instruction,  
Purdue University, West Lafayette, IN 47907

Graduate Research Assistant, Science Education (8/87-8/90)  
Graduate Teaching Assistant, Elementary Science Methods (8/89-5/90)  
The University of Iowa, Iowa City, IA 52242

Adjunct Instructor, Elementary Science Methods (9/84-6/85)  
Utah State University, Logan, UT 84322

Middle School Science Teacher (9/81-6/83)  
Grand County School District, Moab, UT 85432  
Wildlife Technician (3/80-10/80)

Utah State University-U.S. Fish & Wildlife Service-Utah Division of Natural Resources  
Intermountain Mountain Lion Study  
Utah State University, Logan, UT 84322

c. Industrial and Business Positions

Director of Curriculum (1/84-8/87)  
The National Energy Foundation, Salt Lake City, UT 84116

3. Licenses, Registrations, and Certifications

Secondary Education Certificate, State of Utah  
Certification in the protection of human research subjects (4/21/20).  
Certified Project WET facilitator  
Certified Project Wild facilitator  
Certified Hoosier Riverwatch facilitator  
Certified Project WET, Climate, Water and Resilience facilitator

4. Citations in Biographical Works

Academic Keys Who's Who in Science (2006): <http://Sciences.academickeys.com>  
Academic Keys Who's Who in Education (2003): <http://Education.AcademicKeys.com>  
Who's Who in the Midwest (1995-96, 1996-97, 1997-98)  
Who's Who in America (2009)  
Who's Who in American Education (1992-93, 1993-94, 1994-95, 1995-96, 1996-97, 1997-98)  
Men of Achievement, International Biographical Center (1995)  
Who's Who in Science Education Around the World (1992)

5. Awards and Honors

College of Education, Dean's Award for Outstanding Faculty Scholarship (2016/17)  
Department of Curriculum and Instruction Outstanding Faculty Scholarship Award (2016)  
IMPACT Fellow, Purdue University (2016)  
Gustav Ohaus Program for Innovations in College Science Teaching (1988)  
U.S. Department of Energy Award for Energy Innovation (1984)  
Utah Governor's Award for Excellence in Energy Innovation (1984)  
NEA/Kodak Implementation winner, Cameras in the Curriculum (1984)  
NEA/Kodak National Award winner, Cameras in the Curriculum (1983)

6. Memberships in Academic and Professional Societies

National Association for Research in Science Teaching (NARST)  
Association for Science Teacher Education (ASTE)  
National Science Teachers Association (NSTA)  
Hoosier Association of Science Teachers, Inc. (HASTI)  
Environmental Education Association of Indiana, Inc. (EEAI)

## B. EXCELLENCE IN TEACHING

Excellence in teaching is demonstrated through: effective course instruction; participation in course and program development; collaboration with K-12 classroom teachers through inservice programs; scholarly publications and presentations that support teaching; and through the

integration of my research into both my preservice and inservice instruction. Thus, my scholarship contributes directly to the improvement of course instruction, providing undergraduate students, graduate students, and practitioners with current knowledge and understanding about teaching, assessing and learning. Both my preservice and inservice courses actively involve participants/students in constructing their own understanding through engaging them in solving problems, interacting with others, and reflecting on practice.

### 1. Courses Taught, Last Three Years

The science education courses taught have involved undergraduates (EAS 312; EDCI 506), Graduate students and practitioners (EDCI 506, 516, 517, 619) in the Department of Curriculum & Instruction, while EDCI 506 and 516 involved undergraduates and graduates from the Departments of Agricultural Economics, Entomology, Forestry and Natural Resources, and Natural Resources and Environmental Science. I have also taught EDCI 590 (individual projects) and 695 (internship) courses for individual graduate students. Courses taught the last 3 years:

EDCI 506, Environmental Education

EDCI 517, Survey of Science Education

EDCI 516, Seminar in Environmental Education

EDCI 619, Learning Science

EAPS 312, Capstone Environmental Science for Elementary Education Majors

EAPS 360, Great Issues in Science and Society: Climate Change

### 2. Courses with Administrative Responsibility

EDCI 317/365, Elementary Science Methods Coordinator

(Fa 1992, 1993, 1998, 1999, 2000, 2001, 2002, 2003; Sp 1990, 1995, 1996, 1997, 1998, 2001, 2002, 2003)

EAS 312, Capstone Environmental Science for Elementary Education, Coordinated 3

laboratory divisions, 2 teaching assistants, weekly staff meetings (Fa 2004, Sp 2005, Fa 2005, Fa 2006, Sp 2007, Fa 2007, Sp 2008, Fa 2008, Fa 2009, Fa 2010, Fa 2011, Fa 2012, Fa 2013, Fa 2014, Fa 2015, Fa 2016, Fa 2017, Fa 2018, Fa 2019, Fa 2020)

### 3. Contributions to Course and Curriculum Development

Established EDCI 317 field experience with Cumberland and Happy Hollow elementary schools. The field experience provided EDCI 317 students opportunities to develop, implement, and reflect upon conceptual change teaching.

Developed first 16-week EDCI 317 course, and the curriculum for integrating the National Geographic Kids Network. The NG Kids Network was integrated into the EDCI 317 curriculum from the perspective of how children learn and do science.

Chair, Ad hoc Committee to Establish a New Elementary Teacher Education Program (1994-1995).

Participant in the Teacher Education Equity Project at CUNY (1994-1996). The goal of the project is to develop awareness of gender equity issues and research in mathematics and science education and to promote the development and implementation of gender equitable curriculum for the preparation of mathematics and science teachers. Through participation in the project, I have developed curriculum and instructional activities for integrating gender equity issues into the elementary science methods (EDCI 317) course.

The resource materials provided by the project also included a copy of my article *Gender Bias in the Classroom - - A Self-Evaluation* as an exemplary instructional activity for promoting gender equitable classroom interactions.

I have been Collaborating with teachers at Murdock Elementary School to establish a science-literacy PDS site. This process has resulted in: 1) the establishment of a more extensive field experience for EDCI 317 students, initiated during the Spring 1995 semester; 2) the implementation of a gender equity staff-development program, Spring and Fall 1995 semesters; and the establishment of an environmental education experience for students enrolled in EDCI 506/FOR564, Fall 1995 semester. This experience involved teaching children about environmental concepts and issues and designing an environmental compass course and interpretive nature trail for use by teachers at Murdock Elementary School.

I have developed the instructional materials, activities, and school-based field experience to prepare EDCI 317 students to utilize inquiry-based teaching in science. These materials and activities stem from my collaborative research with elementary and middle school teachers, and require EDCI 317 students to reflect on science teaching in light of the state science proficiencies and the NRC Science Education Standards, and to analyze children's work. The experience also requires EDCI 317 students to develop alternative forms of assessment that are embedded in instruction.

I have developed the plant investigation lab to model the teaching of elementary science as inquiry and as a model for incorporating children's self-produced journals as a teaching and assessment tool. EDCI 317 students design and conduct a plant investigation, using their self-produced journals as a tool for data collection and reflection. At the completion of the plant lab, students develop alternative assessment techniques and reflect on the experience in terms of the state science proficiencies and national standards (see publication #28).

I have developed three new teaching modules for EDCI 506/FNR 564 that engage students in learning about doing environmental education. The three modules: Celery Bog, Yellowstone, and Designing Effective Workshops in Environmental Education are "real world" based modules designed to engage students as professional environmental educators. The Celery Bog module emphasizes curriculum development in environmental education and inquiry-based teaching. The Yellowstone module exposes students to pedagogical techniques for teaching about environmental issues, requiring students to develop an issues-based lesson for teaching about an environmental issue facing Yellowstone National Park. The Designing Effective Workshops in Environmental Education prepares students for planning and developing effective environmental education programs for adults and children, requiring students to design an environmental education workshop.

I have been collaborating with Professors Jon Harbor (EAS) and Kerry Rabenold (Bio) on the development of the new Environmental Science Capstone Course for Elementary Teachers. This course has been approved by the Science Education faculty and the School of Science as a required course for elementary education majors in the new reformed program for elementary education.

I have been collaborating with Jon Harbor and Barb Cooper in the development of the IUPUI Geoenvironmental science application course that is designed around the environmental monitoring of the Crooked Creek Watershed and is for teachers.

- Developed curriculum for the new course titled Educational Applications of Environmental Science (EDCI 591). Educational Applications of Environmental Science integrates environmental science content with pedagogy to enhance students' pedagogical-content knowledge of environmental issues. The course is designed to facilitate understanding of current environmental issues and pedagogy for teaching adults and children. The course is designed for educators, environmental professionals, and others interested in learning about environmental science, environmental curriculum, and pedagogy for teaching about environmental issues. The course leads to certification in several nationally sponsored environmental education programs (at cost to students). The course compliments Environmental Education (EDCI 506/FNR 564) by specifically investigating current environmental issues and curricular programs and pedagogy for teaching about environmental topics. Inquiry, issues, and computer-based pedagogy will be used to investigate and explore environmental issues and educational programs. Guest speakers and case studies will also be utilized.
- Collaborated with Murdock Elementary teachers during the 1999 fall semester on the development of an experimental section of EDCI 317 and its implementation spring semester 2000. The section was taught on-site at Murdock Elementary School and emphasizes the integration of theory and practice by providing an extensive field experience component. A major requirement of the pilot section is the development of a case study report by students that explores and investigates science teaching, learning, and assessment in the context of the NRSC's STC curriculum.
- I have developed a new module for EDCI 365 on assessment. The module involves EDCI 365 students in analyzing different assessment tasks and planning an assessment system and three different assessment tasks. For the module I have prepared instructional overheads, selected readings, and written up the classroom activities and project assignment description.
- I developed the science standards module for EDCI 365. The module involves EDCI 365 students in analyzing a videotape of a first-grade classroom from the perspective of the NRC science teaching standards. Students assume the role of a classroom observer (principal) and use the standards-based science teaching observation form I developed to analyze the science teaching they observe in the video.
- Developed the course content, experiences, and activities on inquiry for the science education seminar, EDCI 622.
- Developed the Learner Profile, Instruction Planning, and Designing Assessments modules and assignments for EDCI 365. This included writing up the student assignment sheets for the syllabus packet, creating the content overheads and handouts, and developing the classroom activities.
- Developed the science methods (EDCI 365) component of the Purdue e-portfolio guidelines, INTASC linkages, and rubric.
- Reconfigured the curriculum and field and laboratory experiences for EAS 312, expanding the curriculum to include topics in global warming, invasive species, waste management (2005).
- Developed the course proposal, curriculum, and instructional activities for EDCI 516, Seminar in Environmental Education; prepared course syllabus, reading packet, and guiding questions (Sp 2005; Sp 2007; Sp 2009).

- Developed the course proposal, curriculum, and instructional activities for EDCI 619, Learning Science; prepared course syllabus and reading packet (Sp 2006, Sp 2008)
- Developed the web-based watershed learning module for EAS 312. The site consists of an overview of the watershed concept and two case studies (one on the Great Lakes and one on the Mississippi River), as well as a web-based evaluation survey (Summer/Fa 2006).
- Developed the Celery Bog Nature Center service learning project as part of the EDCI 506 curriculum. Students developed self-contained, self-guided environmental investigation kits for families. The project was supported by Purdue University service learning grant (\$2,000).
- Reconfigured/redesigned the EDCI 506 curriculum to focus on 5 themes: learners and environmental literacy, EE goals and objectives, EE learning experiences and curricular approaches, planning and evaluating EE professional development programs, and EE state and national programs.
- Developed the new curriculum, instructional activities, reading packet, and course syllabus for EDCI 516 (2009), Seminar in Environmental Education that focused on answering the question, "How do different media influence environmental literacy?" The course explored the ways in which different media represent and communicate meaning about the environment and environmental issues. Topics included: What is environmental literacy? Media and environmental literacy, Children's literature and environmental values, Children's animations and environmental values, Newspaper and magazine coverage of the environment, Environmental photography: Visualizing the environment, and the representation of the environment in movies.
- Developed three new labs for EAS 312 (2010): Wetlands Debate, Landfill Siting, and Human Footprint. Also received a College of Science, learning and teaching equipment and technology grant (\$2,000) for the purchase of new equipment for use in three labs: Urban Field Trip, Burnett Creek Field Trip and Wastewater Management lab.
- Developed the biodiversity case study activity and the environmental issues investigation assignment, a problem-based learning experience, for EAS 312 (2011).
- Developed EDCI 516 course/curriculum for 2013 based on the PBS series and nationally acclaimed *Going to Green* program. The *Going to Green* program is designed for educators, community-based organizations, public agency staff, and anyone interested in understanding sustainability and how to achieve meaningful improvements in quality of life and environment. Drawing upon this program, course activities included reading, case studies and data analysis, student presentations, hands-on and project-based learning approaches to learning about sustainable communities. The two main curricular goals were: 1. *Knowledge*: provide background knowledge on a variety of environmental issues related to sustainability and 2. *Action*: provide the tools to move students and the public to action. The text for the class included the Purdue read *No Impact Man*.
- Re-designed the EAPS 312 lectures (2013-14), creating a **flipped** classroom. To accomplish this I developed all new lecture/ instructional materials and activities. I developed three different types of lecture activities: case studies, scenario-based PowerPoints, and workbooks. Each required students to answer guiding questions prior to attending lecture. The guiding questions required students to interpret and analyze data, apply concepts, and explain environmental situations and events. These served as the focal point for lecture activities and discussion. Lecture activities required students to apply concepts to problem sets and to think about and discuss solutions to environmental issues. This approach required students to take more responsibility in their learning, shifting

lecture from the transmission of information to the application and discussion of ideas, concepts and issues.

The service learning project for EDCI 506 in 2014 focused on Berlovitz Woods. The project was designed to provide students with a “real-world” experience in designing and planning an on-site environmental education program. The final product was a site-specific environmental education plan for Berlovitz Woods that was given to Claudine Laufman, Superintendent, Lafayette Parks and Recreation. The project establishes the specific goals and builds a vision for environmental education at Berlovitz Woods. EDCI 506 students also assisted with The Junior Nature Club (JNC) that is sponsored by the local Sycamore Audubon Society. JNC provides environmental education programs and experiences to elementary (grades 3 and 4) and middle school (grades 5, 6, and 7) students.

The service learning project for EDCI 506 in 2015 focused on planning an environmental education program that promotes and supports the development of pollinator gardens. Pollinators—bees, butterflies—are in peril from the loss of habitat and misuse of pesticides. The development of gardens provide habitat that pollinators need to survive. The pollinator program you will develop will consist of: 1) an informational brochure about pollinator gardens, 2) guidelines for planting and maintaining a garden, 3) a school curriculum that engages students in designing, planting, and learning about pollinators and gardens, pollinator gardens as an outdoor lab, 4) a two-hour educational workshop based on the guidelines and curriculum that encourages individuals and schools to create pollinator gardens, 5) a program assessment and evaluation plan and tools, and 6) a press release about the program and workshop. The workshop will be presented as a Wednesday in the Wild program on Dec 9, 7:00-9:00 pm, Lilly Nature Center. In addition, your team will design a pollinator garden for Purdue University that you will present to PU grounds.

Developed the EDCI 516 seminar this semester (Fall 2020) to certify students in *Project Learning Tree* (PLT) Secondary Environmental Education Modules. PLT is recognized as one of the premier environmental education organization and programs in the world. It promotes the investigation of the environment and encourages informed, responsible decision-making. The seminar focused on four environmental topics:

- **Places We Live**, develops strategies for teaching about the places we live, investigating the environment, economic and social aspects of community
- **Focus on Forests**, develops strategies for teaching about forests, including field techniques for investigating woodland and other ecosystems
- **Biodiversity**, develops strategies for teaching about the importance of life on Earth, including the impact of invasive species and urban sprawl
- **Climate Change**, develops strategies for teaching about climate change, emphasizing the impacts on forest ecosystems

The PLT modules served as the main course materials and were supplemented with research articles and other pedagogical resources as needed. Students received the PLT modules and were actively involved, completing the module activities; discussing and practicing the different pedagogical strategies employed in the modules.

Developed the curriculum, data analysis activities, and course projects for EAPS 360, Fall 2021. The course was developed to enhance students’ basic skills and knowledge critical to analyze issues of energy use and climate change that incorporate both societal and scientific perspectives. The goal of this course is not to arrive at particular solutions to the problems associated with climate change but instead to foster an informed discussion and understanding of the issue. Working in teams, students work throughout the semester to complete lecture activities, assignments, and a capstone project. The emphasis is on

developing a general understanding of the climate system and how it is impacted by human activity. Of vital importance in this class is the question of how humans alter and change various components of the climate system and how changes to one-part influence other parts, impacting climate, as well as our environment and human health.

#### 4. Preparation of Instructional Materials

##### a. Test Books

Prepared EDCI 317 midterm packet that required students to: 1) analyze and synthesize research on children's conceptions of solids and liquids and the presentation of the scientific conception of solids and liquids in elementary science textbooks, 2) evaluate the textbooks from the perspective of children's conceptions of solids and liquids, and 3) apply the research findings and class experiences towards teaching the concepts of solids and liquids to children.

Prepared EDCI 517 midterm packet, which required graduate students to analyze a teacher-student interaction transcript and then utilize their analysis as evidence to support a learning theory perspective. Students also had to utilize the transcript as evidence for not supporting other theories of learning.

Developed two new Assessments (Fall 1998), revised Fall 1999, for use in EDCI 317. The assessments are in an alternative format and present students with science teaching, learning, and assessment scenarios that they analyze in response to guiding questions (prompts). The scenarios and guiding questions require students to apply their understandings about science teaching, learning, and assessment.

##### b. Laboratory Manuals

Prepared the following laboratory materials for EDCI 317:

Designing Investigative Centers using Productive Questions  
 Strategies for Analyzing SCIS, SAPA, ESS, FOSS, NCR and Delta Modules  
 Problem Solving in the Elementary Grades: Paper Airplanes and the Principles of Flight  
 Water quality and Solar Energy Lab to coordinate with National Geographic Kids Network  
 Developed the Science Curricular Framework Lab and materials packet  
 Developed the Alternative Assessment laboratory activity and materials  
 Developed the Science Curriculum Adoption laboratory and materials

Prepared the laboratory packet for EAPS 312. I revised the laboratory packet fall 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2017, 2018, 2019, and 2020.  
 Introduction to Environmental Science (revised Fa 2006, 2008, 2010, 2013, 2018)  
 Stream Monitoring Lab/Field Trip (revised Fa 2013, 2018)  
 EnviroMapper: Window to My Environment Computer Lab (revised Fa 2008, 2010, 2011, 2013, 2018)  
 Land Use Change: Here Today-Gone Tomorrow Lab (revised Fa 2005, 2009, 2011, 2013, 2018)  
 Wastewater Treatment: Designing and Building a Model Lab (revised Fa 2006, 2007, 2008, 2010, 2013, 2018)  
 Urban Environments Lab/Field Trip (revised Fa 2005, 2007, 2009, 2010, 2011, 2013, 2018)  
 Making Decisions about Land Use (new 2008; revised 2013, 2018)  
 Biodiversity Forum Lab (revised 2013, 2018)



Using Topographic Maps Lab (revised Fa 2005, 2009, 2013)  
Measuring Water Quality Lab (revised Fa 2005, 2011, 2013, 2018)  
Inquiry Research Project (revised Fa 2005, 2007)  
Wetlands Debate (new Fa 2010)  
Landfill Siting (new Fa 2010)  
Human Footprint (new Fa 2010)  
Alternative Energy (new Fa 2012; revised 2013, 2018)

c. Statement of Course Objectives and Course Reading/Laboratory Packets

Prepared course syllabus and reading packet for EDCI 506

Prepared course syllabus and activity and reading packet for EAPS 360

Prepared course syllabus and laboratory packet for EAPS 312

Prepared course syllabus and reading packet for EDCI 619

Prepared course syllabus and reading packet for EDCI 516

Prepared course syllabus and reading packet for EDCI 317/365

Prepared EDCI 317 packet on strategies for implementing problem solving based instruction

Prepared course syllabus and reading packet for EDCI 517

Prepared course syllabus and reading packet for EDCI 622

Prepared course syllabus and reading packet for EDCI 605

Prepared course syllabus and reading packet for EDCI 591

Prepared course syllabus for G 690

d. Other Materials

Developed situation cards for EDCI 317 on teacher behaviors, teacher-student interactions, classroom management strategies, and student ideas to facilitate student discussion and preparation for the field experience.

Developed environmental scenario cards for EDCI 506/FOR 546 designed to create discussion concerning the social, technological, and scientific aspects of environmental issues; emphasizing that environmental trade-offs are required.

Developed handouts for EDCI 317 titled: "The Inquiry Training Model of Teaching" (3 pages), "Structuring Small Groups in Science for Effective Learning" (5 pages), and "A Problem Solving Model of Teaching" (5 pages).

Developed demonstration video and guides for discussing children's observations and the role of prior knowledge in the construction of meaning, and to exemplify conceptual teaching using demonstrations. The video and guides are based on my 5th grade classroom research on children's construction of meaning from demonstrations (see publication #19). Materials are used in EDCI 317, 517, and 605.

Developed materials on children's (4th grade) conceptual understanding of electric circuits, to use as examples for developing conceptual based instruction and alternative assessment techniques. The materials were developed from my classroom research on children's construction of meaning and social interactions (see publication #20). Materials are used in EDCI 317 and 605.

Developed EDCI 506/FOR 564 instructional activities and assignment materials. These activities focused on the development of an environmental compass course and an interpretive nature trail. Teachers at Murdock Elementary School will utilize the compass course and nature trail to teach children about environmental concepts.

Developed the reflection assignments and videotape activities on laboratory teaching, teacher questioning in the context of Vee Diagrams, using collaborative groups more effectively, and developing and analyzing alternative assessment for INLAB participants (EDCI 590).

Developed the “Science Teachers and Science Classrooms” and “Teacher-Child and Child-Child Interactions during a Science Lesson” instructional activities and assignments to facilitate EDCI 317 students’ field observations and reflective inquiry. The first activity/assignment is designed to expose EDCI 317 students to science classroom structure and environment and science teaching in an elementary school, as well as, the perspectives elementary teachers have about science teaching. The second assignment is designed to facilitate EDCI 317 students’ observations of social interactions during science lessons and gender equity issues.

Developed and revised the course handouts, resources, and instructional activities for the inquiry and alternative assessment topics covered in EDCI 317.

Developed instructional module for EDCI 506/FNR 564 (Fall 1999) that engaged students in writing an Environmental Protection Agency (EPA) environmental education proposal. The EPA proposal served as the context for which students learned about developing needs assessments and program evaluation tools, utilized the environmental education research literature to support the need for and develop an environmental education program. In addition, students also learned about writing proposals, preparing budgets and reviewing proposals.

Co-developed the science and literacy course (EDCI 590) as a part of the Children’s Literacy and Science Project (CLASP). This included creating content overheads and handouts, assessment metrics, classroom activities, and journal examples for analysis.

Developed new student project for EDCI 506, titled “Investigating Your Environment: Photographic Narrative and Interpretive Talk”. The project requires students to use photography to document environmental phenomena, events, situations, and conditions, to learn about the environment by requiring them to visualize and represent the environment as a photographic narrative or theme.

##### 5. Experimentation in Teaching Methods and Techniques

Implemented the National Geographic Kids Network program in EDCI 317, 1991-92. The program required students to conduct inquiry investigations in water quality and solar energy and to telecommunicate with elementary schools and the NG Kids Network. The activities were designed to exemplify inquiry as a teaching model, the nature of science, the relationship between process skills and science content, and the use of computer technology in science teaching.

Developed collaborative group simulation activity where students performed the roles of members of an elementary science curriculum committee charged with the task of re-designing the schools science curriculum. The goal for each group was to design a conceptually based and sequenced science curriculum. I provided each group with a resource packet, which contained readings on curricular and science education reform, and examples of innovative conceptual frameworks. Students were also exposed to “new” conceptually based and innovative elementary science curricula. Students then utilized these resources to construct their conceptual frameworks. Materials used in EDCI 317.

Developed curriculum adoption simulation activity for EDCI 317. Students performed the roles of members of an elementary curriculum adoption committee charged with the task of reviewing, evaluating, recommending an innovative curriculum program for adoption by the elementary school. Each adoption team was provided a resource packet, which contained readings on curricular and science education reform initiatives and state of Indiana curriculum and proficiency guidelines. Each team then evaluated the innovative elementary science curricula, such as: Delta Modules, FOSS, NCSR, ESS, SCIS3. The adoption committees were charged with the preparation of constructing an adoption document that outlined the philosophy, rationale, and goals of their science education program; the curriculum recommended for adoption and the criteria and reasons for adoption; and the reasons why other curricular programs were not recommended for adoption.

#### 6. Special Activities which Contribute to Teaching Effectiveness

I Have collaborated with fifth grade teachers at Hershey Elementary School on the development of conceptual change teaching. This collaboration has provided me with knowledge about conceptual change teaching that I would not have constructed had I not interacted and observed these teachers in a collaborative manner. That is, I have learned from these teachers as they have learned from me. This collaboration has contributed to my elementary methods teaching effectiveness in two ways: 1) it has helped me better understand the techniques needed to be successful at conceptual change teaching, which I integrate into my elementary methods curriculum and instruction; and 2) it provides me with a better understanding of the conceptual ideas children have and how these ideas can "interfere" with learning, which I utilize as examples, with methods students, for designing conceptually based science teaching (see publication numbers 19 and 20).

I have collaborated with a fourth-grade teacher at Happy Hollow elementary school on the use of journals in science teaching. This collaboration has provided me with knowledge about how to effectively incorporate the use of journals into science teaching. I could not have constructed this understanding had I not interacted and observed the use of journals in this classroom. This collaboration has contributed to my elementary methods teaching effectiveness in two ways: 1) it has helped me better understand how to effectively use journals in science teaching, which I have integrated into my elementary methods curriculum and instruction; and 2) it has provided me with an understanding of how children learn science and use journals as a medium to organize and communicate their understandings of science. (See 1994 and 1995 AERA presentation handout for additional information)

I have developed all of the instructional activities and teacher (participant) self-reflection assignments for project INLAB. The self-reflection assignments are designed to engage participants in reflecting upon laboratory instruction and assessment within the culture of their classroom. Further, the assignments engage participants in collaborative dialogue about their reflections and laboratory teaching and assessing practice (see paper presented at the 1994 annual AETS meeting: A Framework and Strategies for Improving Laboratory Instruction and Assessment at the Middle School Level, and the 1995 AERA paper).

I co-developed (with Gerald Krockover and Marie Roth--5th grade elementary teacher) an instructional unit on fruit flies, whereby multimedia and computer technology were integrated into a constructivist based, inquiry teaching unit. I was specifically responsible for developing strategies for assessing students based upon their journal entries (see paper presented at the 1995 NSTA regional conference).

In collaboration with Professor Britsch and a Doctoral Student, I developed a teaching/research project that was implemented at Linnwood Elementary School. The project focused on testing models of inquiry-based science instruction, instructional techniques for using children's self-produced science journals, and investigating the role of small-group social interactions in science learning. This experience contributes to my EDCI 317 teaching effectiveness by providing me first-hand experiences in an elementary classroom using these pedagogical techniques.

#### 7. Institutes and Programs Attended

- a. Purdue University Student Retention Workshop (1992)
- b. Association for the Education of Teachers in Science (AETS) 1993 annual conference.
- c. Cultural Diversity (March 1993). A Faculty Development Workshop Department of C&I
- d. Teacher Education Equity Project (1994-96). Center for Advanced Study in Education, City University of New York Graduate Center, New York.
- e. National Science Teachers Association (NSTA) 1994 regional conference.
- f. Revitalizing Undergraduate Science and Mathematics Education, Michigan State University (May 8-10, 1997), East Lansing, MI.
- g. International Congress of Technology Educators (March 9-12, 1998), Santa Fe, NM.
- h. National Association of Research in Science Teaching (April 19-23, 1998), San Diego, CA.
- i. ArcView Geographic Information System Short-Course (May 14, 1998), Purdue University, West Lafayette, IN.
- j. Association of American Geographers annual meeting (1999), Honolulu, HI
- k. National Association of Research in Science Teaching annual meeting (1999), Boston, MA
- l. The Indiana Adopt-A-Wetland Program, sponsored by the Sierra Club and the Indiana Department of Environmental Management (May 14, 1999), Oakland, IN.
- m. Project Wet (6/23/99). Certified to utilize project wet materials with students and teachers.
- n. Hoosier Riverwatch (7/29/99). Certified Level 1 stream quality monitoring sponsor. Indiana Department of Natural Resources.
- o. Indiana Post-Secondary Science Educators Meeting (11/17/00). Ball State University, Muncie, IN.
- p. Indiana Environmental Education Roundtable (11/20/00). Natural Resources Education Center, Department of Natural Resources, Indianapolis, IN.
- q. P3T3 (1/3-4/01). SOE technology integration training workshop. Purdue University, West Lafayette, IN.
- r. CITI Course in The Protection of Human Research Subjects (9/14/2004). Certificate number 34043.
- s. Climate Change Research and Education Workshop (11/19/2004). Purdue University, West Lafayette, IN.
- t. Hoosier Riverwatch (4/18/06). Certified Hoosier Riverwatch program trainer.
- u. River Vision (11/4/06). Purdue University, West Lafayette, IN.
- v. Equal Access/Equal Opportunity Briefing (4/26/07). Purdue University, West Lafayette, IN.
- w. Multicultural Diversity Forum (2/11-12/08). Purdue University, West Lafayette, IN.
- x. Service Learning at Purdue: Definition, Examples, Challenges, Rewards (4/14/08). Purdue University, West Lafayette, IN.
- y. Project Wild/Wet Facilitator Update Training (3/6/09). IN Dept of Natural Resources, Indianapolis, IN.
- z. Hoosier Riverwatch Facilitator Retreat (2/13/2014). IDEM, Indianapolis, IN.
- aa. Hoosier Riverwatch Facilitator Retreat (1/26/2015). IDEM, Lilly Nature Center, West Lafayette, IN.

- bb. Amazon Publishing Workshop (2/26/2015). Purdue University, West Lafayette, IN.
- cc. Project Wild Facilitator Retreat (3/07/2015). IN Dept of Natural Resources, Carmel, IN.
- dd. Tech Tuesday (12/15/2015). ITaP, Purdue University, West Lafayette, IN.
- ee. CITI Course in The Protection of Human Research Subjects (9/14/2015).
- ff. Project Wild Facilitator Retreat (3/5/2016). IN Dept of Natural Resources, Bloomington, IN.
- gg. IMPACT program, Purdue University (spring 2016)
- hh. Purdue University Center for the Environment Symposium: New Ideas for Interdisciplinary Environmental and Sustainability Education (3/31/2016). Purdue University, West Lafayette, IN.
- ii. NAAEE Environmental Education Framework workshop (10/30/19). Spencer, IN (McCormick Creek St Pk.).
- jj. Indiana Department of Natural Resources, Project Wild & Wet Facilitator Workshop (1/18-19/2020). Spencer, IN (McCormick Creek St Pk).
- kk. Indiana Department of Environmental Management, Hoosier RiverWatch Facilitator Workshop (3/6/2020). Indianapolis, IN.
- ll. Project WET, Climate, Water and Resilience facilitator online certification (12/10/20)

9. Other Evidence of Teaching Excellence

a. CIS Instructor and Course Appraisal Core Items, EDCI 517, Survey of Science Education

Semester/Year	N	CO1	CO2	CO3	CO4	CO5
Fall 1992	11	4.3	4.4	4.3	4.1	4.2
Fall 1994	09	4.0	4.1	4.0	4.0	4.0
Fall 1995	10	4.3	4.9	4.7	4.3	4.9
Fall 1997	12	3.9	4.4	4.2	3.9	4.1

Semester/Year	N	CO1	CO2
Fall 2001	10	4.3	4.1
Fall 2002	20	4.7	4.6
Fall 2004	19	3.9	3.9
Fall 2006	16	3.8	3.8
Fall 2008	9	3.9	3.9
Fall 2010	5	4.7	4.7
Fall 2011	2	4.0	4.0
Fall 2018	4/7	4.8	5.0

b. CIS Instructor and Course Appraisal Other Items, EDCI 517, Survey of Science Education

Item	Fa92	Fa94	Fa95	Fa97
#2 ...inst. underst. course topics	4.8	4.6	4.8	4.8
#24 ...course intell. fulfilling	4.6	4.0	4.5	4.0
#38 ...emphasizes concept. under.	4.9	4.4	4.9	4.4
#67 ...sts encouraged to contr.	4.7	4.6	4.9	4.6
#91 ...course cont. to prof. growth	4.7	4.0	4.8	4.2
#99 ...course gives excellent bkgr. for further study	4.8	4.0	4.5	4.1

PICES Other Items, EDCI 517

Item	Fa01	Fa02	Fa04	Fa06	Fa08	Fa10
My instructor emphasizes conceptual understanding	4.9	4.7	4.2	3.9	4.2	
Course material pertinent to professional training	4.8	4.8	4.4	3.5	4.3	4.3
The format of this course is appropriate	4.7	4.6	4.0	3.8	4.0	

Student presentations in class are interesting	4.5	4.0	3.9	3.9	4.6	
The course provides an opp. to learn from other sts	4.8	4.9	4.3	4.0	4.6	
My instructor encourages questions and exp. of ideas	4.5	4.9	4.2	4.1	4.4	
The assigned readings sign. contribute to course	4.3	4.7	4.1	3.8	4.1	
My inst. permits freedom in choosing paper topics	4.8	4.9	4.6	4.3	4.6	
Each student is encouraged to contribute to class learn.	4.7	4.7	4.6	4.1	4.3	
I keep up with the reading assignments	4.5	4.6	4.6	4.1	4.6	4.7
I actively participate in class	4.8	4.6	4.4	4.4	4.8	4.7
Interacting with other sts. In class helps me learn	4.8	4.7	4.2	4.2	4.8	4.7
I can apply the learning ... to work in my future prof						4.3
The practical app of subject matter is apparent						4.1
Assignments related to goals of course						4.7
This course ... opp. To develop original ideas						4.3
My instructor uses various act. To involve me in learning						4.9

## PICES Other Items, EDCI 517

Item	Fa11	Fa18
Course material pertinent to professional training	4.0	4.8
I keep up with the reading assignments	4.5	4.5
I actively participate in class	5.0	4.8
I always prepare before coming to class	3.5	4.8
The practical app of subject matter is apparent	4.0	4.8
This course ... opp. To develop original ideas	4.0	4.5
My instructor uses various act. involve me in learning	4.0	5.0
Course requirements are clear	5.0	4.8
Course builds understanding of concepts and principles	4.0	5.0

- c. Summary of anonymous student feedback for EDCI 517, Module Feedback Form Fall 2000. The matrix below summarizes the Module Feedback Forms for the fall 2000 Semester. The Cumulative Module Feedback matrix below is a sum of all Module Feedback forms.

## Cumulative Module Ratings/Feedback (Totals/percentages of all module feedback forms)

Question Item	Rating 1 (Low)	Rating 2	Rating 3 (High)
1. Course readings introduced different ideas about and assisted me in understanding science teaching.	Not helpful 0	Helped some 23 (66%)	Very helpful 11 (32%)
2. Course discussion assisted me in understanding science teaching.	Not helpful 1 (3%)	Helped some 12 (35%)	Very helpful 21 (62%)
3. The st. synthesis papers and discussions provided me with insight into science teaching.	Not at all 0	Somewhat 13 (38%)	Yes, good overview 21 (62%)
4. The instructor provided the appropriate assistance in helping me and the class understand science teaching.	Not at all 0	Somewhat 12 (35%)	Just right, good job 22 (65%)
5. Overall I would rate the readings and discussions as:	Not helpful 0	Helpful 20 (59%)	Very helpful 14 (41%)

- d. Summary of anonymous student feedback for EDCI 517, Module Feedback Form Fall

2001. The matrix below summarizes the Module Feedback Forms for the fall 2001 Semester. The Cumulative Module Feedback matrix below is a sum of all Module Feedback forms.

Cumulative Module Ratings/Feedback (Totals/percentages of all module feedback forms)

Part I Question Items	Rating 1 (Low)	Rating 2	Rating 3 (High)
1. Rate and list and describe three things that you have learned.	Learned little 0	Learned something 6 (23%)	Learned a lot 20 (77%)
2. Rate and list two activities/ experiences that assisted you in learning.	Didn't help 0	Helped some 10 (38%)	Helped a lot 16 (62%)
3. Rate and identify two things you could do to better prepare yourself for learning.	I did little 0	I did some 14 (54%)	I did a lot 12 (46%)
4. Rate and describe how you see the modules contributing to your professional growth	Contributed little 0	Contributed some 8 (31%)	Contributed a lot 18 (69%)
Part II Question Items	Rating 1 (Low)	Rating 2	Rating 3 (High)
1. Course readings introduced different ideas about and assisted me in understanding science teaching.	Not helpful 0	Helped some 11 (42%)	Very helpful 15 (58%)
2. Course discussion assisted me in understanding science teaching.	Not helpful 1 (1%)	Helped some 3 (11%)	Very helpful 22 (85%)
3. The instructor provided the appropriate assistance in helping me and the class understand science teaching	Not at all 0	Somewhat 2 (8%)	Just right, good job 24 (92%)
4. Overall I would rate the readings and discussions as:	Not helpful 0	Helpful 14 (54%)	Very Helpful 12 (46%)

d. CIS Instructor and Course Appraisal Core Items, EDCI 317, Elementary Science Methods

Semester/Year	N	CO1	CO2	CO3	CO4	CO5
Fall 1990	13	2.0	1.8	2.1	1.4	1.4
Spring 1991	22	4.0	3.8	3.9	3.9	3.8
Fall 1991	10	2.3	4.0	3.3	2.8	3.1
Fall 1992	27	3.9	4.0	3.9	3.9	4.0
Fall 1993	27	3.9	4.1	4.1	3.7	3.8
Spring 1995	21	3.1	3.9	3.8	3.5	3.3
Spring 1996	23	3.9	3.9	4.2	3.8	3.6
Spring 1997	15	4.0	4.0	4.0	3.6	3.4
Spring 1998	23	3.9	3.9	3.8	3.4	3.6

PICES, EDCI 317/365

Semester/Year	N	CO1	CO2
Spring 2001	22	3.1	3.3
Spring 2002	21	3.3	3.4
Spring 2003	25	3.5	3.9

e. CIS Instructor and Course Appraisal Other Items, EDCI 317, Elementary Science Methods

Item	Sp91	Fa91	Fa92	Fa93	Sp95	Sp96	Sp97	Sp98
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#2 ...inst. underst. course topics	4.7	4.1	4.5	4.5	4.5	4.5	4.4	4.7
#19 ...many methods in learning	4.6	3.9	4.1	4.2	3.8	4.0	4.2	4.0
#38 ...emphasizes concept. under.	4.6	3.9	4.3	4.5	4.0	4.4	4.1	4.3
#67 ...sts encouraged to contr.	4.5	3.9	4.5	4.1	3.9	4.0	4.4	4.0
#90 ...pertinent to profession	4.6	4.3	4.5	4.2	4.3	4.2	4.2	4.3
#92 ...apply skills learned	4.6	4.5	4.6	4.3	4.0	4.4	4.3	4.2
#98 ...practical app. apparent	4.5	4.4	4.4	4.4	4.1	4.2	4.2	4.2
#140...group work cont. to class	4.5	4.0	4.3	4.2	3.4	4.1	4.4	4.1

PICES Other Items, EDCI 317/365

Item	Sp01	Sp02	Sp03	
Course gives skills/techniques applicable to my career	4.1	3.8	3.9	
I developed skills needed by professionals in my field	4.0	3.7	3.8	
I can apply the learning in class to my profession	4.0	3.7	4.0	
The practical application of subject matter is apparent	4.0	3.3	3.8	
Collaborative work is a valuable part of course	4.3	4.0	4.3	
I always prepare before coming to class		3.9	3.0	3.8
I keep up with the reading assignments	2.2	2.2	3.6	
The amount of field experience is adequate	3.5	3.9	3.8	
Field experience is well coordinated with course work	4.0	3.1	3.5	

f. PICES Instructor and Course Evaluations EAPS 312

PICES Core Items

Item	Fa04- (n=42)	Sp05+ (n=74)	Fa05+ (n=72)	Fa06 (n=61)	Fa07 (n=51)	Fa08 (n=63)
I would rate this course as	2.8	2.5	3.2	3.8	3.9	4.0
I would rate this instructor as	3.3	4.3	4.0	4.0	4.2	4.0

-Shepardson/Cooper combined  
 +Co-taught w/Cooper, PICES for Shepardson

PICES Core Items

Item	Fa09 (n=68)	Fa10 (n=77)	Fa11 (50/84)	Fa12 (64/113)	Fa13 (65/96)	Fa14 (33/75)
I would rate this course as	3.5	3.4	3.0	3.2	2.9	3.7
I would rate this instructor as	3.8	3.7	3.2	3.3	3.1	4.0

PICES Core Items

Item	Fa15 (39/72)	Fa16 (22/49)	Fa17 (36/65)	Fa18 (23/26)	Fa19 (54/60)
I would rate this course as	3.6	3.8	3.2	3.7	2.9
I would rate this instructor as	3.8	3.9	3.6	3.9	3.5

PICES Required Items

Item	Fa04- (n=42)	Sp05+ (n=74)	Fa05+ (n=72)	Fa06 (n=61)	Fa07 (n=51)	Fa08 (n=63)
Respect for me and other students	3.8	4.8	4.5	4.7	4.8	4.0
Open to student's questions	3.8	4.8	4.6	4.7	4.8	5.0
Encourages exchange of ideas	3.4	4.8	4.4	4.6	4.8	4.0
Takes my views/comments seriously	3.7	4.8	4.4	4.6	4.8	4.0
Preparation for this course was	4.1	4.8	4.3	4.6	4.8	5.0
Knowledge of the material being covered	4.1	4.9	4.6	4.7	4.9	5.0
Enthusiasm for teaching was	3.9	4.8	4.3	4.4	4.6	4.0
Acceptance of criticism & responsiveness	3.3	4.6	4.1	4.3	4.6	4.0
Sensitivity to students needs/interests	3.3	4.6	4.1	4.3	4.7	4.0



Learning experience	2.7	2.7	3.1	3.9	4.2	4.0
Textbook	2.3	2.3	2.5	3.1	3.3	3.0
Availability of resources	3.1	3.2	3.6	3.8	4.3	4.0
<u>Requirement for my major</u>	<u>2.4</u>	<u>2.0</u>	<u>2.6</u>	<u>3.7</u>	<u>4.1</u>	<u>3.0</u>

-Shepardson/Cooper combined

+Co-taught w/Cooper, PICES for Shepardson

PICES Required Items	Fa09	Fa10	Fa11	Fa12	Fa13	Fa14
<u>Item</u>	<u>(n=68)</u>	<u>(n=77)</u>	<u>(50/84)</u>	<u>(63/113)</u>	<u>(65/96)</u>	<u>(33/75)</u>
Respect for me and other students	4.5	3.8	3.9	4.1	3.9	4.6
Open to student's questions	4.5	4.1	4.1	4.3	4.1	4.8
Encourages exchange of ideas	4.4	3.8	3.8	4.1	4.1	4.6
Takes my views/comments seriously	4.3	3.8	3.6	4.1	3.7	4.4
Preparation for this course was	4.5	4.5	4.2	4.2	4.0	4.6
Knowledge of the material being covered	4.8	4.6	4.7	4.5	4.6	4.8
Enthusiasm for teaching was	4.0	3.8	3.8	3.7	3.8	4.4
Acceptance of criticism & responsiveness	4.1	3.6	3.5	3.8	3.6	4.2
Sensitivity to students needs/interests	4.0	3.5	3.4	3.8	3.4	4.4
Learning experience	3.6	3.4	3.0	3.3	3.0	3.8
Availability of resources	3.8	3.8	3.6	3.6	3.8	4.1
<u>Requirement for my major</u>	<u>3.4</u>	<u>3.2</u>	<u>2.8</u>	<u>3.0</u>	<u>2.8</u>	<u>3.5</u>

PICES Required Items	Fa15	Fa16	Fa17	Fa18	Fa19
<u>Item</u>	<u>(39/72)</u>	<u>(22/49)</u>	<u>(36/65)</u>	<u>(23/26)</u>	<u>(54/60)</u>
Respect for me and other students	4.3	4.5	4.4	4.2	4.0
Open to student's questions	4.4	4.8	4.6	4.4	4.0
Encourages exchange of ideas	4.3	4.5	4.4	4.2	3.9
Takes my views/comments seriously	4.2	4.4	4.2	4.1	3.6
Inst Preparation for this course was	4.3	4.8	4.6	4.5	4.0
Knowledge of the material being covered	4.9	4.9	4.7	4.8	4.4
Enthusiasm for teaching was	4.4	4.6	4.3	4.4	4.0
Acceptance of criticism responsiveness	4.1	4.3	4.0	3.7	3.4
Sensitivity to students needs/interests	4.0	4.1	4.1	3.7	3.7
Learning experience	3.6	3.8	3.3	4.0	3.0
Availability of resources	4.0	4.2	4.1	4.1	3.4
<u>Requirement for my major</u>	<u>3.5</u>	<u>3.6</u>	<u>3.2</u>	<u>3.7</u>	<u>2.7</u>

## PICES EAPS 312 New (2020) Required Items, Median

<u>Item</u>	<u>Fa 20*</u>
	<u>(32/54)</u>
The class activities are well prepared and organized.	4.0
The assignments aid me in achieving the class objectives.	4.0
The projects or laboratories aid me in achieving the class objectives.	4.0
The examinations aid me in achieving the class objectives.	4.0
The instructor clearly explains material so that I can understand it.	3.0
The instructor is open to my questions and effectively answers them.	4.0
The instructor seems to care that I learned this material.	4.0

The instructor willingly makes time to help other students and me.	4.0
The instructor is fair and consistent in evaluating my performance in the course.	4.0
The instructor created a welcoming and inclusive classroom environment.	4.0
I understand the course requirements and grading scale.	4.0
My instructor is knowledgeable about the course topic.	4.0
My instructor encourages questions and expression of ideas.	4.0
My instructor takes my views and comments seriously.	4.0
This class provides a meaningful learning experience.	3.0

\*Fa 2020 instruction (lectures/labs) was modified to address COVID-19 protocols

g. PICES, EDCI 516

<u>Semester/Year</u>	<u>N</u>	<u>CO1</u>	<u>CO2</u>
Spring 2005	5	3.9	3.9
Spring 2007	6	4.5	4.5
Spring 2009	6	4.3	4.9
Fall 2013	4/10	4.5	4.5
Spring 2016	1/3	3.0	4.0
Spring 2017	2/3	4.5	4.5
Spring 2018	4/5	4.8	4.8

PICES Other Items, EDCI 516

<u>Item</u>	<u>Sp05</u>	<u>Sp07</u>	<u>Sp09</u>	<u>Fa13</u>	<u>Sp17</u>	<u>Sp18</u>
Treats all students with respect				5.0	5.0	5.0
Explains material clearly				4.3	4.5	4.5
Gives appropriate/timely feedback				5.0	4.5	4.8
Incorporates current developments in the field				4.3	4.5	5.0
Course builds understanding of concepts				4.2	4.5	4.5
Course requirements are clear				4.8	4.5	5.0
Pertinent to my professional training	4.0	4.8	4.2	4.2	4.5	4.8
Format of course is appropriate	4.1	4.5	4.3	4.8	5.0	4.5
I keep up with the readings	4.1	4.1	4.5	5.0	5.0	5.0
I actively participate in class	4.3	4.8	4.9	4.8	5.0	4.8
I learned new ways to think	4.0	4.5	4.9	4.8	5.0	4.8

PICES EDCI 516 New (2020) Required Items, Median

<u>Item</u>	<u>Fa 20*</u> <u>(3/15)</u>
The class activities are well prepared and organized.	5.0
The assignments aid me in achieving the class objectives.	5.0
The projects or laboratories aid me in achieving the class objectives.	5.0
The examinations aid me in achieving the class objectives.	N/A
The instructor clearly explains material so	5.0

that I can understand it.	
The instructor is open to my questions and effectively answers them.	5.0
The instructor seems to care that I learned this material.	5.0
The instructor willingly makes time to help other students and me.	5.0
The instructor is fair and consistent in evaluating my performance in the course.	5.0
The instructor created a welcoming and inclusive classroom environment.	5.0

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\*Fa 2020 instruction (lectures/labs) was modified to address COVID-19 protocols

h. PICES, EDCI 619

<u>Semester/Year</u>	<u>N</u>	<u>CO1</u>	<u>CO2</u>
Spring 2006	8/8	4.8	4.9
Spring 2008	10/10	4.5	4.6
Spring 2015	5/7	4.3	4.7
Spring 2020	0/10	N/A COVID-19, no course evaluations	

PICES Other Items, EDCI 619

<u>Item</u>	<u>Sp06</u>	<u>Sp08</u>	<u>Sp15</u>
Inst provides app/timely feedback			4.7
Inst treats sts with respect			4.7
Inst explain material clearly			4.7
Course req are clear			5.0
Course builds understanding			5.0
Pertinent to my professional training	4.7	4.7	4.9
I can apply the learning . . . future profession	4.8	4.8	4.7
My instructor uses various act. . . . in learning	4.7	4.7	4.7
Course provides opp to develop original ideas	4.3	4.3	4.7
I always prepare before class	4.8	4.8	4.9
I actively participate in class	4.7	4.9	4.9

i. ENVISION Summer Institute Evaluations (2000-03 mean ratings)

<u>Items</u>	<u>N</u>	<u>Mean (0 Low, 5 High)</u>
Overall, the institute is among the best I have attended	71	4.6
Overall, the institute's instruction is among the best	71	4.6
Overall, the institute has improved my teaching	71	4.7

j. CLASP Summer Institute and Fall Workshop Evaluations (2002)

<u>Items (Summer Activities/Experiences)</u>	<u>N</u>	<u>Mean (0 Low, 5 High)</u>
Overall Summer Institute Instructional Quality	18	4.8
Overall Summer Institute Quality	18	4.9
Overall Instructional Ratings for Fall Workshops	18	4.3

k. Summary of anonymous student feedback for EDCI 317, Module Feedback Form Fall 2000. The matrix below summarizes the Module Feedback Forms for the fall 2000 Semester. The Cumulative Module Feedback matrix below is a sum of all Module Feedback forms.

## Cumulative Module Ratings/Feedback (Totals/percentages of all module feedback forms)

Question Item	Rating 1 (Low)	Rating 2	Rating 3 (High)
1. Rate and describe three things that you learned about teaching science.	Learned very little: 0	Learned something: 50 (54%)	Learned a lot: 42 (46%)
2. Rate and list two activities that assisted you in learning about teaching science	Didn't help: 0	Helped some: 47 (52%)	Helped a lot: 44 (48%)
4. Rate and identify two things you could do to better prepare for class.	I did little: 0	I did some: 42 (47%)	I did a lot: 47 (53%)
5. Rate and describe how you see this module contributing to your professional growth.	Contributed little: 5 (5%)	Contributed some: 39 (42%)	Contributed a lot: 48 (52%)
6. Rate and describe the overall quality of this module in learning to teach science.	Poor: 1 (1%)	Okay: 24 (26%)	Good: 67 (73%)

Note: Item 3 does not require students to rate the module, but only to identify ways of improving the module.

- Summary of anonymous student feedback for EDCI 317, Module Feedback Form Spring 2001. The matrix below summarizes the Module Feedback Forms for the Spring 2001 Semester. The Cumulative Module Feedback matrix below is a sum of all Module Feedback forms.

## Cumulative Module Ratings/Feedback (Totals/percentages of all module feedback forms)

Question Item	Rating 1 (Low)	Rating 2	Rating 3 (High)
1. Rate and describe three things that you learned about teaching science.	Learned very little: 0	Learned something: 40 (71%)	Learned a lot: 16 (29%)
2. Rate and list two activities that assisted you in learning about teaching science	Didn't help: 0	Helped some: 33 (57%)	Helped a lot: 25 (43%)
3. Rate and identify two things you could do to better prepare for class.	I did little: 1 (2%)	I did some: 23 (38%)	I did a lot: 37 (60%)
4. Rate and describe how you see this module contributing to your professional growth.	Contributed little: 4 (6%)	Contributed some: 30 (48%)	Contributed a lot: 28 (46%)
5. Rate and describe the overall quality of this module in learning to teach science.	Poor: 3 (5%)	Okay: 26 (44%)	Good: 30 (51%)

Note: Item 3 does not require students to rate the module, but only to identify ways of improving the module.

- CIS Instructor and Course Appraisal Core Items, EDCI 506, Environmental Education

Semester/Year	N	CO1	CO2	CO3	CO4	CO5
Fall 1991	14	4.1	3.8	4.3	3.9	3.9
Fall 1993	17	3.9	3.9	4.0	3.9	3.8
Fall 1995	28	3.6	4.1	4.2	3.8	3.8
Fall 1997	24	4.1	4.0	4.1	3.8	4.0

PICES, EDCI 506 (CO1=Course, CO2=Instructor)

Semester/Year	N	CO1	CO2
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Fall 2001	19	4.4	4.3
Fall 2003	13	4.4	4.1
Fall 2005	6	4.5	4.2
Fall 2007	9	4.3	4.3
Fall 2009	7	3.8	3.7
Fall 2012	3	4.3	5.0
Fall 2014	6/9	4.5	4.8
Fall 2015	6/9	4.1	4.1
Fall 2016	5/6	4.7	4.7
Fall 2017	3/9	4.8	4.8
Fall 2019	5/10	4.9	5.0

## n. CIS Instructor and Course Appraisal Other Items, EDCI 506, Environmental Education

<u>Item</u>	<u>Fa91</u>	<u>Fa93</u>	<u>Fa95</u>	<u>Fa97</u>
#2 ...inst. underst. course topics	NA	4.7	4.2	4.6
#19 ...many methods in learning	4.4	4.4	4.3	4.0
#67 ...sts encouraged to contribute	4.8	4.7	4.5	4.5
#90 ...pertinent to profession	4.7	4.0	4.3	4.2
#92 ...apply skills learned	4.7	4.6	4.2	4.3
#98 ...practical app. apparent	4.4	4.3	4.3	
#140...group work cont. to class	4.0	4.1	4.3	4.2

## PICES Other Items, EDCI 506

<u>Item</u>	<u>Fa01</u>	<u>Fa03</u>	<u>Fa05</u>	<u>Fa07</u>	<u>Fa09</u>	<u>Fa12</u>
Treats all students with respect						4.3
Explains material clearly						5.0
Gives appropriate/timely feedback						4.8
Incorporates current developments in the field						4.0
Course builds understanding of concepts						4.8
Course requirements are clear						4.8
Course material pertinent to professional training	4.3	4.4	4.8	4.8	3.9	4.0
I can apply the learning in class to my profession	4.4	4.4	5.0	5.0	4.0	4.3
The practical application of subject matter is apparent	4.6	4.2	4.3	5.0	3.8	na
My instructor uses various activities to invl. me in learn.	4.4	4.6	4.9	4.8	4.0	4.8
Assignments are related to goals of course	4.3	4.4	4.5	4.9	3.8	4.3
This course gives opp. to develop original ideas	4.6	4.1	4.8	5.0	4.0	4.3
I always prepare before coming to class	4.2	4.0	4.3	4.3	4.0	4.3
I keep up with the reading assignments	4.3	4.3	4.5	4.6	3.8	na
I actively participate in class	4.8	4.4	4.9	4.6	4.1	4.3

<u>Item</u>	<u>Fa14</u>	<u>Fa15</u>	<u>Fa16</u>	<u>Fa17</u>	<u>Fa19</u>
Treats all students with respect	4.5	4.8	4.7	5.0	4.9
Explains material clearly	4.9	4.1	4.7	4.3	4.7
Gives appropriate/timely feedback	4.5	4.5	4.7	4.8	4.7
Incorporates current developments in the field	4.8	4.3	4.3	4.8	4.7
Course builds understanding of concepts	4.8	4.3	4.7	4.8	4.9
Course requirements are clear	4.9	4.3	4.9	4.0	4.9
Course material pertinent to professional training	4.5	4.3	4.0	5.0	5.0
I can apply the learning in class to my profession	4.8	4.5	4.0	5.0	5.0
My instructor uses various activities to invl. me in learn.	4.7	4.8	4.7	4.8	4.9
Assignments are related to goals of course	4.8	4.3	4.9	4.8	4.7
I always prepare before coming to class	4.8	4.2	4.7	4.8	4.7
I actively participate in class	4.8	4.5	4.9	4.8	5.0

**o. New, Instructor and Course Appraisal Items, EDCI 506, Environmental Education, Fall 2021; n = 8/15.**

**Item means ranged from 4.38 to 4.88 with the median for all items 5.00.**

Question		5	4	3	2	1	Mean	Std	Median
The course is well organized.	n	6	2	0	0	0	4.75	0.46	5.00
	%	75.00%	25.00%	0.00%	0.00%	0.00%			
The assignments aid me in achieving the class objectives.	n	5	3	0	0	0	4.63	0.52	5.00
	%	62.50%	37.50%	0.00%	0.00%	0.00%			
The projects or laboratories aid me in achieving the class objectives. [where relevant]	n	6	2	0	0	0	4.75	0.46	5.00
	%	75.00%	25.00%	0.00%	0.00%	0.00%			
The tests or exams aid me in achieving the course objectives. [where relevant]	n	5	1	2	0	0	4.38	0.92	5.00
	%	62.50%	12.50%	25.00%	0.00%	0.00%			
The instructor communicates clearly.: Daniel Shepardson	n	7	1	0	0	0	4.88	0.35	5.00
	%	87.50%	12.50%	0.00%	0.00%	0.00%			
The instructor effectively answers students' questions.: Daniel Shepardson	n	6	2	0	0	0	4.75	0.46	5.00
	%	75.00%	25.00%	0.00%	0.00%	0.00%			
The instructor seems to care about my learning in this course.: Daniel Shepardson	n	6	1	0	1	0	4.50	1.07	5.00
	%	75.00%	12.50%	0.00%	12.50%	0.00%			
The instructor makes time to help students.: Daniel Shepardson	n	6	1	1	0	0	4.63	0.74	5.00
	%	75.00%	12.50%	12.50%	0.00%	0.00%			
The instructor is fair in evaluating my performance in the course.: Daniel Shepardson	n	6	1	1	0	0	4.63	0.74	5.00
	%	75.00%	12.50%	12.50%	0.00%	0.00%			
The instructor created an inclusive learning environment.: Daniel Shepardson	n	6	2	0	0	0	4.75	0.46	5.00
	%	75.00%	25.00%	0.00%	0.00%	0.00%			

Scale: 5 = Strongly Agree, 4 = Agree, 3 = Neither Agree nor Disagree, 2 = Disagree, 1 = Strongly Disagree

**p. CIS Instructor and Course Appraisal Core Items, EDCI 605, Science in the Elementary School**

Semester/Year	N	CO1	CO2	CO3	CO4	CO5
Summer 1995	05	4.9	4.9	4.9	4.7	4.7

**q. CIS Instructor and Course Appraisal Other Items, EDCI 605, Science in the Elementary School**

Item	Su95
#2 ...inst. underst. course topics	4.9
#24 ...intellectually fulfilling	4.7
#38 ...emphasizes conceptual understand.	4.7
#67 ...sts encouraged to contribute	4.7
#91 ...contributes to prof. growth	4.3
#140...group work cont. to class	4.9

**r. PICES Evaluation, EDCI 591, Seminar in Environmental Education**

Semester/Year	N	CO1	CO2
Spring 2001	8	3.9	4.0

PICES Evaluation Other Items, EDCI 591

<u>Item</u>	<u>Sp01</u>
Course gives skills/techniques applicable to my career	3.5
I developed skills needed by professionals in my field	4.1
The format of course is appropriate to course purpose	3.8
Student presentations contribute to course	3.5
Course provided an opportunity to learn from others	3.8
Course gives me opportunity to develop original ideas	4.5
I actively participate in class activities & discussions	4.3

## s. PICES Evaluation, EDCI 622, Seminar in Science Education

<u>Semester/Year</u>	<u>N</u>	<u>CO1</u>	<u>CO2</u>
Spring 2002	8	4.5	4.7

## PICES Evaluation Other Items, EDCI 622

<u>Item</u>	<u>Sp02</u>
My instructor emphasizes conceptual understanding	4.9
This course material is pertinent to my prof. training	4.9
I can apply the learning in this class my future prof.	4.9
The format of course is appropriate to course purpose	4.8
This course provides an opp. to learn from other sts.	4.7
I always prepare before coming to class	4.5
I keep up with the reading assignments	4.5
I actively participate in class activities & discussions	4.9
Interacting with other sts. helps me learn	4.9

t. INLAB Participant Evaluation Survey Results, Average Rate for the Project's (1993-96)  
Academic year workshops (n=28) and Summer Institutes (n=31); 5 Strongly Agree, 1  
Strongly Disagree (mean ratings)

<u>Question</u>	<u>Academic Year</u>	<u>Summer Institutes</u>
1. The instruction was clear and appropriate.	4.4	4.1
2. The instruction and activities have effectively challenged me to think.	4.8	4.7
3. Each participant is encouraged to contribute to the learning process.	4.6	4.7
4. I can apply the practices/ideas learned in the project to my teaching.	4.7	4.8
5. The group sharing sessions contribute ... to learning and practice	4.7	4.4
6. The assignments and activities motivate me to do my best work.	4.6	4.4
7. Project assignments are interesting and stimulating.	4.3	4.2
8. Overall, this inservice project is among the best I have participated in.	4.6	4.6
9. Overall, the instruction has been among the best inservice instruction	4.5	4.5
10. Overall, the project has improved teaching and assessment practice	4.8	4.9

u. New, Instructor and Course Appraisal Items, EAPS 360, Great Issues in Society: Climate Change, Fall 2021; n = 6/16

Item means ranged from 4.83 to 5.00 with the median for all items 5.00.

Question		5	4	3	2	1	Mean	Std	Median
The course is well organized.	n	6	0	0	0	0	5.00	0.00	5.00
	%	100.00%	0.00%	0.00%	0.00%	0.00%			
The assignments aid me in achieving the class objectives.	n	6	0	0	0	0	5.00	0.00	5.00
	%	100.00%	0.00%	0.00%	0.00%	0.00%			
The projects or laboratories aid me in achieving the class objectives. [where relevant]	n	6	0	0	0	0	5.00	0.00	5.00
	%	100.00%	0.00%	0.00%	0.00%	0.00%			
The tests or exams aid me in achieving the course objectives. [where relevant]	n	6	0	0	0	0	5.00	0.00	5.00
	%	100.00%	0.00%	0.00%	0.00%	0.00%			
The instructor communicates clearly.: Daniel Shepardson	n	6	0	0	0	0	5.00	0.00	5.00
	%	100.00%	0.00%	0.00%	0.00%	0.00%			
The instructor effectively answers students' questions.: Daniel Shepardson	n	6	0	0	0	0	5.00	0.00	5.00
	%	100.00%	0.00%	0.00%	0.00%	0.00%			
The instructor seems to care about my learning in this course.: Daniel Shepardson	n	6	0	0	0	0	5.00	0.00	5.00
	%	100.00%	0.00%	0.00%	0.00%	0.00%			
The instructor makes time to help students.: Daniel Shepardson	n	6	0	0	0	0	5.00	0.00	5.00
	%	100.00%	0.00%	0.00%	0.00%	0.00%			
The instructor is fair in evaluating my performance in the course.: Daniel Shepardson	n	6	0	0	0	0	5.00	0.00	5.00
	%	100.00%	0.00%	0.00%	0.00%	0.00%			
The instructor created an inclusive learning environment.: Daniel Shepardson	n	6	0	0	0	0	5.00	0.00	5.00
	%	100.00%	0.00%	0.00%	0.00%	0.00%			
My instructor seems well-prepared for class.: Daniel Shepardson	n	6	0	0	0	0	5.00	0.00	5.00
	%	100.00%	0.00%	0.00%	0.00%	0.00%			
My instructor encourages questions and expression of ideas.: Daniel Shepardson	n	6	0	0	0	0	5.00	0.00	5.00
	%	100.00%	0.00%	0.00%	0.00%	0.00%			
My instructor provides useful feedback throughout the semester.: Daniel Shepardson	n	6	0	0	0	0	5.00	0.00	5.00
	%	100.00%	0.00%	0.00%	0.00%	0.00%			
My instructor makes learning interesting and motivates students to learn.: Daniel Shepardson	n	6	0	0	0	0	5.00	0.00	5.00
	%	100.00%	0.00%	0.00%	0.00%	0.00%			
This course improves my understanding of concepts and principles in this field.	n	5	1	0	0	0	4.83	0.41	5.00
	%	83.33%	16.67%	0.00%	0.00%	0.00%			

Scale: 5 = Strongly Agree, 4 = Agree, 3 = Neither Agree nor Disagree, 2 = Disagree, 1 = Strongly Disagree

### C. EXCELLENCE IN RESEARCH, SCHOLARSHIP, AND CREATIVE ENDEAVOR

My primary area of scholarship focuses upon children's understandings and ways of thinking/reasoning about science phenomena, while my secondary area emphasizes instruction that challenges children's understandings and ways of thinking about science phenomena. Although the primary area of my research has remained consistent, my methods of study have changed to reflect the kinds of questions I now ask about teaching and learning. My research method has evolved from a quantitative approach to a qualitative approach. My research is unique in that it not only investigates children's conceptual understandings and ways of thinking about science phenomena, but looks at the role social interactions play in the understandings children construct and how they think about science phenomena as they solve problems. The



research also looks at children's conceptual frameworks/mental models and how their frameworks are challenged and restructured by encounters with anomalous data derived from science investigations. My research has recently expanded to explicitly incorporate the role of science journals in children's developing understandings of science phenomena.

#### 1. Published Papers

My scholarly publications have been cited by other scholars over 535 times based on SSCI.

##### a. Refereed Papers

1. Radcliffe, R.\* and Shepardson, D.P.\* (1983). Photographic geology: A multimedia module for individualized field trips. In S. Nixon (Ed.), Cameras in the Curriculum: A Challenge to Teacher Creativity, vol.1. NEA/Kodak.
2. Shepardson, D.P.\* (1984). Snapshot curriculum. Science Scope, 8, 14-15.
3. Shepardson, D.P.\* (1985). Teaching teachers how to utilize photography in their curriculum. In S. McMillan and F. Quinto (Eds.), Cameras in the Curriculum: A Challenge to Teacher Creativity, vol.2. NEA/Kodak.
4. Saunders, W.L.\* and Shepardson, D.P.\* (1987). A comparison of concrete and formal science instruction upon science achievement and reasoning ability of sixth grade students. Journal of Research in Science Teaching, 24, 39-51.
5. Pizzini, E.L.\*, Abell, S.K., and Shepardson, D.P. (1988). Rethinking thinking in the science classroom. The Science Teacher, 55, 22-25.
6. Pizzini, E.L., Shepardson, D.P.\*, and Abell, S.K. (1989). A rationale for and the development of a problem solving model of instruction in science education. Science Education, 73, 523-534.
7. Abell, S.K.\*, Pizzini, E.L., and Shepardson, D.P. (1989). The textbook scan. Science and Children, 27, 36-37.
8. Pizzini, E.L., Shepardson, D.P.\*, and Abell, S.K. (1991). The inquiry level of junior high activities: Implications to science teaching. Journal of Research in Science Teaching, 28, 111-121.
9. Pizzini, E.L.\* and Shepardson, D.P.\* (1991). SSCS problem solving and effective inservice education. Iowa Educational Leadership, 7, 19-26.
10. Shepardson, D.P.\* and Pizzini, E.L. (1991). Teaching teachers: Gender bias in the classroom--A Self-Evaluation. Science and Children, 29, 38-41.
11. Shepardson, D.P.\* and Pizzini, E.L. (1991). The questioning level of junior high school science textbooks and the implication to the learning of textual information. Science Education, 75, 673-682.
12. Pizzini, E.L. and Shepardson, D.P.\* (1991). Student questioning interactions in the presence of the teacher during problem solving in science. School Science and Mathematics, 91, 348-352.
13. Pizzini, E.L., Shepardson, D.P.\*, and Abell, S.K. (1992). The questioning level of select middle school science textbooks. School Science and Mathematics, 92, 74-79.

14. Pizzini, E.L. and Shepardson, D.P.\* (1992). A comparison of the classroom dynamics of a problem solving and traditional laboratory model of instruction using path analysis. Journal of Research in Science Teaching, 29, 243-258.
15. Shepardson, D.P.\* and Pizzini, E.L (1992). Gender bias in female elementary teachers' perceptions of the scientific ability of students. Science Education, 76,147-153.
16. Shepardson, D.P.\* and Pizzini, E.L. (1993). A comparison of student perceptions of science activities within three instructional approaches. School Science and Mathematics, 93, 127-131.
17. Shepardson, D.P. (1993). Publisher based science activities of the 1980's and thinking skills. School Science and Mathematics, 93, 264-268.
18. Shepardson, D.P.\* and Pizzini, E.L. (1994). Gender, achievement, and perception toward science activities. School Science and Mathematics, 94, 188-193.
19. Shepardson, D.P.\*, Moje, E.\*, and Kennard, A. (1994). The impact of a science demonstration on children's construction of meaning. Journal of Research in Science Teaching, 31, 243-258.
20. Shepardson, D.P.\* & Moje, E\*. (1994). The nature of fourth graders' understandings of electric circuits. Science Education, 78, 489-514.
21. Shepardson, D.P. (1995). Mathematics and science teaching and learning on the information superhighway. Journal of Computers in Mathematics and Science Teaching, 14, 9-26.
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24. Shepardson, D.P. (1996). Social interactions and the mediation of science learning in two small groups of first-graders. Journal of Research in Science Teaching, 33,159-178.
25. Shepardson, D.P.\* & Britsch, S.J.\* (1996). When dinosaurs roamed: Hypermedia and the learning of mathematics and science. Journal of Computers in Mathematics and Science, 1/2, 7-18.
26. Shepardson, D.P.\* & Adams, P.E. (1996). Coming to know and understand alternative assessment in science. Journal of Science Teacher Education 7, 267-282. **[Note: Article is recognized by AETS as a model program for teacher inservice.]**
27. Shepardson, D.P. (1997). The nature of student thinking in life science laboratories. School Science and Mathematics, 97, 37-44.
28. Shepardson, D.P.\* & Britsch, S.J.\* (1997). Children's science journals: Tools for teaching, learning, and assessing. Science and Children, 34, 13-17 & 46-47. **Included in the California Science Framework (2017).**

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75. Young, J.\* & Shepardson, D.P.\* (2017). Using Q methodology to investigate undergraduate students' attitudes toward the geosciences. *Science Education*, (DOI) - 10.1002/sce.21320
76. Ghadiri Khanaposhtani, M., ChangChia, J.L., Gottesman, B., Shepardson, D.P., & Pijanowski, B. (2018). Evidence that an informal environmental summer camp can contribute to the construction of the conceptual understanding and situational interest of STEM in middle-school youth. *International Journal of Science Education*, DOI: 10.1080/21548455.2018.1451665
77. Shepardson, D.P. (2019): Students' conceptions of and feelings about land use: Building a conceptual framework for teaching and learning about land use. *Journal of Geography*, 118(6), 252-265, DOI: 10.1080/00221341.2019.1593487
78. Shepardson, D.P. & Hirsch A.S. (2019). Teaching climate change: What educators should know and can do. *American Educator*, 43(4) 4-13. **Cover article for this issue, distributed to over 800,000 educators/members; summarized in the Dec 30, 2019 Marshall Memo—a weekly round-up of important ideas and research in k-12 education. [http://www.aft.org/ae/winter2019-2020/shepardson\\_hirsch](http://www.aft.org/ae/winter2019-2020/shepardson_hirsch). The article serves as the guiding framework for the Project Wild and National Wildlife Federation Climate Education program (2020). The article is also the guiding framework for IN DOE K-12 Climate Change Education framework that is linked to the IN Standards (2020-21).**
79. Britsch, S.\* & Shepardson, D.P.\* (2021). The Use of Teacher Resources in a Sheltered Science Unit on Watersheds. *Science Educator*, 28(1), 41-53.
80. Janakiraman, S., Watson, S.L., Watson, W.R., & Shepardson, D.P. (2021) Exploring the influence of digital games on environmental attitudes and behaviors based on the new ecological paradigm scale: A mixed-methods study in India. *Journal of Education for Sustainable Development*, 15(1), 72-99.

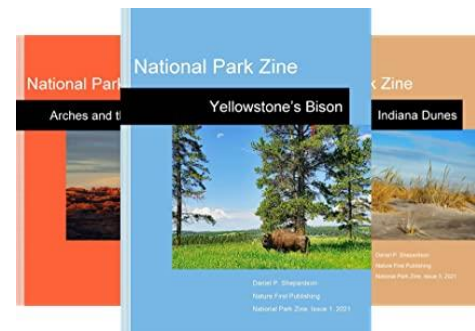
## 2. Other Publications

### a. Monographs/Special Issues/Proceedings

1. Pizzini, E.L.\*, Abell, S.K\*, & Shepardson, D.P\* (1992). Problem solving: An effective

- practice. In W.J. McIntosh and M. Caprio (Eds.), Successful approaches to teaching introductory science courses. Cedar City, UT: Society for College Science Teachers.
2. Kyle, W.C. \*, Abell, S.K. \*, Shepardson, D.P. \*, & Seals, M. \* (1994). The National Geographic kids network elementary science methods course implementation at Purdue University. In C.L. Julyan, and M.S. Wiske (Eds.), Learning along electronic paths: Journeys with the NGS Kids Network. Cambridge, MA: TERC.
  3. Editor (1995), Telecommunications special issue of Journal of Computers in Mathematics and Science Teaching. As Editor of the special issue I was involved in soliciting manuscripts from professionals in the field to provide a diverse collection of articles on the use of telecommunications in the teaching and learning of mathematics and science, reviewing and editing manuscripts for publication, and organizing the manuscripts in the special issue. I also served as ghostwriter for several articles.
  4. Editor (1996), Use of Multimedia and Hypermedia special issue of Journal of Computers in Mathematics and Science Teaching. As Editor of the special issue I was involved in soliciting manuscripts from professionals in the field to provide a diverse collection of articles on the use of multimedia and hypermedia in the teaching and learning of mathematics and science, reviewing and editing manuscripts for publication, and organizing the manuscripts in the special issue.
  5. Krockover, G.H. \*, Roth, M.C. \*, Shepardson, D.P. \*, & Webb, M. \* (1997). Using technology in a constructivist manner to enhance the science education curriculum. In K. Calhoun, R. Panwar, & S. Shrum (eds.), International Organization for Science and Technology Education, 8th Symposium Proceedings, Volume 3: Practice. Edmonton, Canada: University of Alberta.
  6. Krockover, G.H.\* and Shepardson D.P.\* (2000). Improving undergraduate geoscience instruction through action based research teams. Third International Conference on Geoscience Education: Conference Proceedings. Sydney, Australia: University of New South Wales.
  7. National Park Zine (2021). National Park Zine was successfully launched in 2021, with three issues published: Yellowstone's Bison, Arches and the Golden Hour, and Indiana Dunes. Nature First Publishing.

National Park Zine integrates nature photography with natural history to tell a story about a national park as a series of lived experiences. Each issue focuses on a different national park through color as well as black-and-white photography to provide the reader with different perspectives on the geology, plant communities, and wildlife found in each park. The visual story in each issue thus captures the majesty, power, and mystique of a national park. It is hoped that this will afford readers the opportunity to experience national parks in ways they may not have been able to do firsthand.



## b. Books

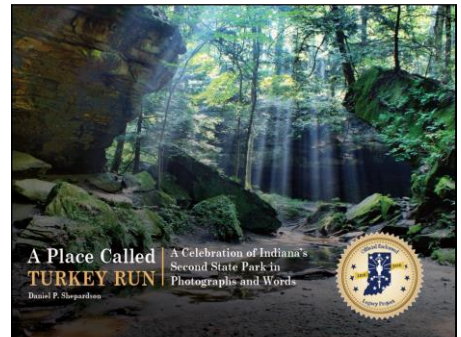
Shepardson, D.P. (2001). *Assessment in science: A guide to professional development and classroom practice* (Ed.). Dordrecht, Netherlands: Kluwer Academic Publishers.

Shepardson, D.P., Harbor, J., Bell, C., Wee, B., Klagges, H., Meyer, J., Priddy, M., Melton, W., Schellenberger, L., Leuenberger, T., Koschmann, M., Fast, J., & Burgess, W. (2005). *ENVISION: An Environmental Science Institute for Teachers*. West Lafayette, IN: Purdue University.

Shepardson, D.P. (2012). *Visualizing Nature: A Journey through the Midwest in Photographs and Words*. Nature First Publishing, [http://issuu.com/danshepardson/docs/visualizing\\_nature](http://issuu.com/danshepardson/docs/visualizing_nature)

Shepardson, D.P. (2016). *A Place Called Turkey Run: A Celebration of Indiana's Second State Park in Photographs and Words*. Purdue University Press. Officially Endorsed Indiana Legacy Project.

Shepardson, D.P. (2016). *Photographing Turkey Run: A Guide to Nature Photography*. Purdue University Press.



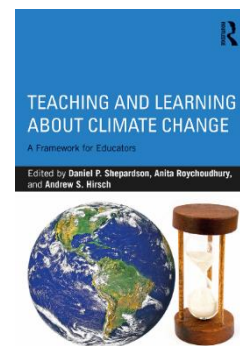
About the book: Turkey Run became Indiana's second state park in 1916. Within its boundaries lie some of the more rugged and stunning landscapes to be found in Indiana. Its sandstone bluffs and canyons, created by centuries of melting glaciers and running water, are filled with unique landforms and beautiful landscapes supporting a wide array of plant and animal life. A Place Called Turkey Run captures the majesty and mystique of the park in text and hundreds of full-color images. The work is organized into six distinct photo essays on the park's beauty: sandstone; bluffs and canyons; flowing water; snow and ice; tall trees; and flowers, ferns, and fungi. This book is published to honor the natural heritage of the land it describes, in celebration of Turkey Run's hundredth anniversary as an Indiana State Park.

Shepardson, D.P., Roychoudhury, A., and Hirsch, A. S. (2017). *Teaching and Learning about Climate Change: A Framework for Educators*. Routledge

**(Identified by Yale University in 2019 as the top of nine key climate change books for educators**

<https://www.yaleclimateconnections.org/2019/09/nine-climate-change-books-for-educators/>)

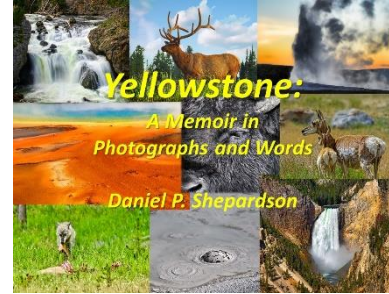
Given the international importance of climate change and the significant role education plays in preparing citizens to be in a knowledgeable position to address this issue, the *Teaching and Learning about Climate Change: A Framework for Educators* aims to enhance climate change education through scholarly chapters written around three themes: (1) Theoretical, philosophical, and conceptual frameworks for guiding climate change education and research, (2) Research on teaching and learning about global warming and climate change that informs practice, and (3) Approaches to professional development and classroom practice that enhance teaching and learning.





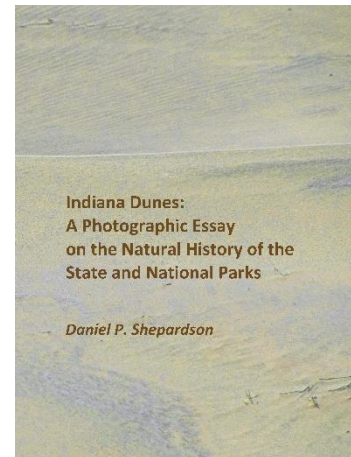
Shepardson, D.P. (2021). *Yellowstone: A Memoir in Photographs and Words*. Nature First Publishing.

*Yellowstone: A Memoir in Photographs and Words* is based on my 50 years of hiking, photographing, and learning about the park. Each chapter draws upon the unique experiences I have had in the park by integrating my personal story and photographs with the natural history of Yellowstone. The aim is to tell a visually and textually stimulating story, reflecting my efforts over the years to document and capture the majesty, power, and mystique that is Yellowstone. I have photographed the park at different times of the day and different times of the year under different lighting and meteorological conditions to provide differing perspectives on the park's geology, plant communities, and wildlife. I have drawn from my earlier photographs from the 1960s in order to provide a personal and historical look at the park. Occasionally, where appropriate, I have included photographs taken by William Henry Jackson, one of the first photographers to photograph Yellowstone (courtesy of the National Park Service). I do this to document changes in the park, not only over my lifetime, but across three centuries. My hope is that the photographs and text will complement each other as readers journey from Yellowstone's volcanic formation to its impressive hydrothermal features, to its wildlife and their struggles to survive.



Shepardson, D.P. (2021). *Indiana Dunes: A Photographic Essay on the Natural History of the State and National Parks*. Nature First Publishing.

I have organized this book around the four environments of beach, dunes, woods, and wetlands. This journey through the Dunes closely follows their geological formation and evolution as well as plant succession. We begin at the beach, where lake and land meet, an environmentally harsh place to survive. This is the starting point for the formation of dunes. Over time, waves and currents transport and deposit sand on the beach. Wind moves it farther inland resulting in the formation of sand dunes. The dunes themselves are explored in Chapter 2. Chapter 3 next addresses the role of plant ecology and succession in the formation of dunes, populated by grasses, oaks, and wildflowers. Finally, in Chapter 4, the diversity and beauty of the wetlands that form between dunes and in low-lying areas is revealed. Wetlands constitute perhaps the most biologically diverse area of the Dunes, but probably the most overlooked and underappreciated environment. Taken together, the four chapters closely follow 6,000 years of natural history.



c. Book chapters

1. Moje, E.B.\* & Shepardson, D.P.\* (1998). Social interactions and children's changing understanding of electric circuits, in B. Guzzetti & C. Hyndy (Eds.), *Studies in conceptual change: Theoretical perspectives*. Lawrence Erlbaum Associates, Inc.
2. Moje, E.B.\* & Shepardson, D.P.\* (1998). Social interactions and children's changing understanding of electric circuits: Exploring unequal power relations in "peer" learning groups, in B. Guzzetti & C. Hyndy (Eds.), *Studies in conceptual change: Theoretical perspectives*. Lawrence Erlbaum Associates, Inc.

3. Shepardson, D.P. (2001). A professional development framework for collaborating with teachers to change classroom practice, in D.P. Shepardson (Ed.), Assessment in science: A guide to professional development and classroom practice (pp. 9-38). Dordrecht, Netherlands: Kluwer Academic Publishers.
4. Gummer, E.S.\* & Shepardson, D.P.\* (2001). The NRC standards as a tool in the professional development of science teachers' assessment knowledge and practice, in D.P. Shepardson (Ed.), Assessment in science: A guide to professional development and classroom practice (pp. 39-52). Dordrecht, Netherlands: Kluwer Academic Publishers.
5. Gummer, E.S.\* & Shepardson, D.P.\* (2001). Facilitating change in classroom assessment practice: Issues for professional development, in D.P. Shepardson (Ed.), Assessment in science: A guide to professional development and classroom practice (pp. 53-67). Dordrecht, Netherlands: Kluwer Academic Publishers.
6. Shepardson, D.P. (2001). Thinking about assessment: An example from an elementary classroom, in D.P. Shepardson (Ed.), Assessment in science: A guide to professional development and classroom practice (pp. 67-82). Dordrecht, Netherlands: Kluwer Academic Publishers.
7. Shepardson, D.P.\* & Gummer, E.S.\* (2001). A framework for thinking about and planning classroom assessment in science, in D.P. Shepardson (Ed.), Assessment in science: A guide to professional development and classroom practice (pp. 83-98). Dordrecht, Netherlands: Kluwer Academic Publishers.
8. Shepardson, D.P.\* & Britsch, S.J.\* (2001). Tools for assessing and teaching science in elementary and middle school, in D.P. Shepardson (Ed.), Assessment in science: A guide to professional development and classroom practice (pp. 119-148). Dordrecht, Netherlands: Kluwer Academic Publishers.
9. Shepardson, D.P. (2001). What we have learned: A summary of chapter themes, in D.P. Shepardson (Ed.), Assessment in science: A guide to professional development and classroom practice (pp. 251-256). Dordrecht, Netherlands: Kluwer Academic Publishers.
10. Shepardson, D.P.\* and Britsch, S.J.\* (2003). Analyzing children's science journals, in Susan Koba (Ed.), Mixing it up: Integrated, interdisciplinary, intriguing science in the elementary classroom (pp. 52-59). Arlington, VA: National Science Teachers Association Press.
11. Britsch, S.J.\* & Shepardson, D.P.\* (2007). CLASP: An approach to helping teachers interpret children's science journaling (pp. 237-262), in V.L. Akerson (Ed.), Interdisciplinary Language Arts and Science Instruction in the Elementary Classroom. Lawrence Erlbaum Associates, Inc.
12. Shepardson, D.P.\* & Leuenberger, T. (2008). Field Studies as a Pedagogical Approach to Inquiry (pp. 53-64), in Luft, J., Bell, R.L., & Gess-Newsome, J., (Eds.). Science as inquiry in the secondary setting. Arlington, VA: National Science Teachers Association Press.
13. Shepardson, D.P.\* & Britsch, S.J.\* (2011). The art of reviewing science journals: Questions to consider when planning and assessing students' journal entries (pp. 271-276), in J. Wheeler-Toppen (Ed.), Science the Write Way. Arlington, VA: National Science Teachers Association Press.

14. Roychoudhury, A\*. Shepardson, D.P\*. & Hirsch, A.S\*. (2017) System Thinking and Teaching in the Context of Climate System and Climate Change, in Shepardson, D.P., Roychoudhury, A. and Hirsch, A. (Eds), Teaching and Learning about Climate Change: A Framework for Educators, Routledge.
15. Shepardson, D.P.\*, Roychoudhury, A.\* & Hirsch, A.\* (2017) Students' Conception of a Climate System: Implications for Teaching and Learning, in Shepardson, D.P., Roychoudhury, A. and Hirsch, A. (Eds), Teaching and Learning about Climate Change: A Framework for Educators, Routledge.
16. Shepardson, D.P.\*, Roychoudhury, A.\* & Hirsch, A.S.\* (2017) Using Conceptual and Physical Models to Develop Students' Mental Models of the Greenhouse Effect, in Shepardson, D.P., Roychoudhury, A. and Hirsch, A. (Eds), Teaching and Learning about Climate Change: A Framework for Educators, Routledge.
16. Choi, S \* & Shepardson, D.P.\* (2017) "This Idea they Have is Not Really to Me, Like True:" How Seventh Grade Students Make Meaning of Scientific Arguments about the Impact of Global Warming on Tornadoes and Hurricanes, in Shepardson, D.P., Roychoudhury, A. and Hirsch, A. (Eds), Teaching and Learning about Climate Change: A Framework for Educators, Routledge.

d. Web Sites

1. ENVISION web site. Collaborated on the design of the ENVISION web site. The web site provides information about the project, disseminates instructional materials and activities developed by project staff, and makes available staff written publications.
2. CLASP web site. Designed and developed the Children's Literacy and Science Project web site. The web site provides information about the project, research on children's journaling, and how to apply. The site also disseminates information about the professional development model and contains examples of activities, teacher work, and video clips of teacher activity.
3. Developed/Maintained the EAPS 312 Brightspace site. The site provides students access to the Lecture assignments and course syllabus, links to environmental and education websites, on- time grading.
4. Developed the EDCI 516 Brightspace site. The site provides students access to lecture PPTs, course syllabus, and links to environmental and education websites.
5. Developed the EDCI 619 Blackboard site. The site provides students access to lecture PPTs, course syllabus, and readings. Served as class discussion and activities site during COVID-19 online only portion of spring 2020.
6. Developed the EDCI 5017 Blackboard site. The site provides students access to lecture PPTs, course syllabus, and readings.
7. Developed/Maintained the EAPS 360 Brightspace site. The site provides students access to the lecture activities, readings, and course syllabus.
8. Developed/Maintained the EDCI 506 Brightspace site. The site provides students access to the lecture activities, readings, and course syllabus.

## e. Other publications

1. Shepardson, D.P (1984). The effects of Concrete and Formal Instruction on Adolescents. Unpublished masters report, Department of Secondary Education, Utah State University, Logan, UT.
2. Editor, *The Energist*, The National Energy Foundation, Salt Lake City, UT, 1984-87.
3. Editor, *Top Hit Energy Lesson Plans*, The National Energy Foundation, Salt Lake City, UT, 1987.
4. *Energy in Science Series*, The National Energy Foundation, Salt Lake City, UT, 1988.
5. Shepardson, D.P. (1988). *Useful Problem Solving: SSCS Activity Guide*. Science Education Center, The University of Iowa, Iowa City, IA.
6. Shepardson, D.P. (1990). The relationships between problem solving phase, student interactions, and thinking skills among middle school students taught within the SSCS problem solving instructional model. Dissertation, The University of Iowa, Iowa City, IA.
7. Shepardson, D.P.\* & Pizzini, E.L. (1991). Evaluation of SSCS: Summary of research findings. In E.L. Pizzini (Ed.), *SSCS Assessment Information and Research Findings*. Science Education Center, The University of Iowa, Iowa City, IA.
8. Stensvold, M.\* & Shepardson, D.P.\* (1994). Reflections of central Indiana science teachers on laboratory instruction and assessment strategies. *The Hoosier Science Teacher*, 20, 56-63.
9. Krockover, G.H.\* & Shepardson, D.P.\* (1995). The missing links in gender equity research. *Journal of Research in Science Teaching*, 32, 223-224.
10. Pekarek, R.\* , Krockover, G.H.\* , & Shepardson, D.P.\* (1996). The research-practice gap in science education. *Journal of Research in Science Teaching*, 33, 111-113.
11. Krockover, G.H.\* & Shepardson, D.P.\* (1996). Educators' perspective: National science education standards. *Bulletin of the American Meteorological Society*, 77, 1293-1294.
12. Shepardson, D.P. (1996). Evaluation report of the Florida International University Summer Camp.
13. Krockover, G.H.\* , Pekarek, R.M.\* , Riggs, C.G.\* , & Shepardson, D.P.\* (1997). Identifying characteristics of the multi-age intermediate classroom that foster successful learning for children.
14. Shepardson, D.P.\* & Klich, D.\* (1998). Evaluation report on the pilot program: Collaborative action based research science and mathematics partnerships for excellence in K-12 Teacher preparation.

## 3. Work in Process, Journal Articles and Books

1. Shepardson, D.P. (in process). *National Park Memoir*.

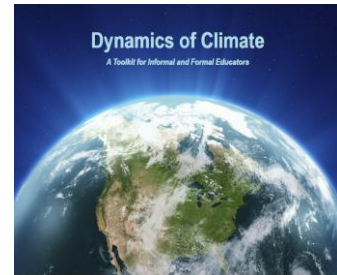
#### 4. Instructional and Professional Development Curricula and Materials Development

*Activities for Conceptualizing Climate and Climate Change* (2008), <http://www.purdue.edu/discoverypark/climate/climate-change/index.php>, consist of 18 different activities grouped into four modules that focus on climate and climate change concepts: ecological implications, greenhouse gases, extreme weather, and natural processes. The activities are data-rich and visualization-based. A visual library as a resource for grade 7-12 teachers and students is provided as well as a Teacher Guide for each activity. The activities were selected and recognized by CLEAN (Climate Literacy and Energy Awareness Network) in 2012 as high-quality resources that address climate and energy related topics. Educational resources that have been selected for the CLEAN Collection are aligned with the Climate Literacy Essential Principles or Energy Awareness Principles and passed through an extensive peer-review process to verify the accuracy and currency of the science.



In 2013 the ACCCC activities were adopted by the Maryland and Delaware Climate Education, Assessment, and Research Project (MADE CLEAR) for dissemination in Maryland and Delaware through the Maryland and Delaware state science curricula, as well as for alignment to the Next Generation Science Standards for implementation in grades 8 and 9.

*The Dynamics of Climate* (2013), <http://www.purdue.edu/discoverypark/climate/climate-change/index.php>, is a professional development toolkit designed for informal and formal educators interested in conducting professional development for teachers and the public. The toolkit takes a climate system approach to understanding how the Earth's climate is changing. The toolkit utilizes climate datasets and activities to develop participants' understanding of climate. The small group and individual activities require participants to interpret, analyze, and represent climatic data and use scientific concepts to explain climate events. The program was developed around four guiding questions: What is a climate system, what are the components that make up this system? What happens when we change the components of a climate system? What are the climate and environmental impacts of a changing climate system? And what can people do about a changing climate system? The toolkit consists of six components: 1) program manual that describes the professional development program and resources for implementing an effective professional development program, 2) PowerPoint program with video clips and talking points, 3) presenter's guide that details the talking points, video clips, and the instructional activities, 4) materials packet that includes the handouts, visuals, and data sets for implementing the instructional activities and program, 5) a teachers' guide to teaching about the climate system, and 6) an administrative packet that provides suggestions for implementing a professional development program.



In 2013 the toolkit was adopted by the Maryland and Delaware Climate Education, Assessment, and Research Project (MADE CLEAR) as a means for delivering teacher professional development in Maryland and Delaware.

**Indiana Climate Change Impact Activities (2020-21).** The activities are being developed based on the PCCRC's Indiana climate change impact report/data. The activities are data-rich and for grade 7-12. Three activities are currently available: Indiana's Precipitation: Will It Be Wetter or Drier? Indiana's Temperature: How Hot Will It Get? U.S. and Indiana Fossil Fuel Use and Carbon Dioxide Emissions. The activities are available on the PCCRC website.

The Dynamics of Climate Conference. The three-day conference was held on May 15-17, 2013. The conference utilized speakers, breakout sessions (for modeling and guided practice), and work sessions (i.e., Planning for Action). The conference prepared formal and informal educators to use the toolkit to deliver teacher professional development. The Purdue Climate Change Research Center (PCCRC) and the Center for the Environment (C4E) collaborated in the development and implementation of the conference. The conference attracted 43 individuals from various formal and informal educational institutions and organizations. For example, the Chicago Academy of Sciences, Saint Joseph's College, University of Tennessee at Martin, SUNY Fredonia, National Weather Service, NUVO/Indiana Living Green, Penn State University, Delaware State University, Sustainable Indiana, Great Lakes Research and Education, Midwest Regional Climate Center, Captain Planet Foundation (GA), Purdue University, and Jasper County CES.

- Overall, I would rate the quality of the conference: 4.6/5.0
- Overall, the conference provided me with the tools and resources to conduct professional development for teachers and/or to teach about global warming and climate change: 4.5/5.0

The Dynamics of Climate Conference for Secondary Teachers. The conference was held on June 18-20, 2014. The conference utilized speakers and breakout sessions (for modeling and guided practice). The conference prepared secondary teachers to use the toolkit to deliver teacher professional development and to enhance classroom instruction. The Purdue Climate Change Research Center (PCCRC) and the Center for the Environment (C4E) collaborated in the development and implementation of the conference. The conference attracted 41 individuals from various schools from IL, IN, MI and OH. The conference was well received based on evaluation data:

- Overall, I would rate the quality of the conference: 4.6/5.0
- Overall, the conference provided me with the tools and resources to conduct professional development for teachers and/or to teach about global warming and climate change: 4.6/5.0

Soundscape Middle School Curriculum Development Project (2018). The following soundscape instructional activities for middle school science classrooms has been developed: 1) types of sounds in nature (biophony, geophony, anthrophony), 2) sounds vs noise, 3) impact of noise on wildlife, 4) meaning of sounds (Intra-species, Inter-species communication), 5) sound locations (Spatial and Temporal), 6) changes in sounds (daily, seasonally, yearly), 7) sounds and environments/landscapes (soundscapes), 8) changing landscapes changing sounds, 9) measuring sounds/soundscapes (wave forms and spectrographs), 10) monitoring Soundscapes, 11) soundscapes as indicators of environmental quality, and 12) physics of sounds (frequency (pitch) and amplitude (loudness)).

To view a short video about the project (2017):  
<https://www.youtube.com/watch?v=VwbM1Myv0IO>

## 5. Exhibition of Creative Work

*Images of Celery Bog* (2007-present), a permanent environmental education photo exhibit on display at the Celery Bog Nature Center, West Lafayette, IN.

*Celery Bog Sunset* (2007), honorable mention, Lafayette—West Lafayette Convention and Visitor Bureau, One Great Photo Contest. The image has been used in advertisements promoting Tippecanoe County.

*Clarian Photos for Health* (2008-present), nine nature photographs were selected for permanent exhibition at *Indiana University Melvin and Bren Simon Cancer Center*. The



photography collection focuses on images from nature that evoke a sense of peace, healing and wellness.

*Clarian Photos for Health* (2008-present), three tree photographs were selected for permanent exhibition at *Clarian Arnett Hospital*. The photography collection focuses on images of trees, their inhabitants and environments; the symbolic and medicinal meaning of trees.

*Mind Boglying Event* (2010, 2012, 2013, 2015) Celery Bog photographs were selected for exhibition at the *Mind Boglying Event*, a celebration of the Celery Bog Nature Area, West Lafayette, IN.

*Indiana Nature Conservancy* (2013). Honorable mention Indiana Nature Conservancy 2013 photography contests. Several images used in state newsletter.

Nature's Best Backyard Photography (2017) national winner. Image appeared in Nature's Best Photography magazine.

## 6. Invited Lectures Presented

### a. International Meetings

1. Shepardson, D.P. (1991). SSCS Problem Solving: An Effective Classroom Practice. Soviet/American Convention, Moscow State University, Moscow, Soviet Union.
2. Krockover, G.H. & Shepardson, D.P. (1996). Using technology to enhance the science education curriculum. International Organization of Science and Technology Education, Edmonton, Alberta, Canada.
3. Shepardson, D.P. (1996). A vygotskian perspective on learning science: Vignettes and interviews from a first grade science activity. King's College, The University of London, England.
4. Krockover, G.H. & Shepardson, D.P. (2000). Improving undergraduate geoscience instruction through action based research teams. International Conference on Geoscience Education, Sydney, Australia.
5. Krockover, G.H. & Shepardson, D.P. (2003). Using action based research teams to foster constructivist approaches to reform undergraduate college earth science teaching. GeoScience Education IV, Calgary, Canada.
6. Program Co-chair (2007-08), Earth System Science strand (symposia), 33<sup>rd</sup> International Geoscience Congress (IGC), August 5-14, 2008, Oslo, Norway. Responsible for soliciting, reviewing, and developing the Earth System Science program, as well as co-presenting during the symposia: Using action based research teams to foster constructivist approaches to reform undergraduate college earth system science teaching.

### b. National Meetings

1. Saunders, W.L. and Shepardson, D.P. (1984). The effects of concrete and formal instruction on reasoning and science achievement. NARST National Convention, New Orleans, LA.
2. Shepardson, D.P., Pizzini, E.L., and Abell, S.K. (1989). An analysis of the questioning level of junior high school science textbooks: Implications for science teaching and learning. NARST National Convention, San Francisco, CA.
3. Pizzini, E.L., Shepardson, D.P., and Abell, S.K. (1989). Making textbook science come alive. NSTA National Convention, Seattle, WA.

4. Shepardson, D.P., Abell, S.K., and Pizzini, E.L. (1989). Strategies for improving student thinking utilizing science textbooks. NSTA National Convention, Seattle, WA.
5. Carber, M., Miller, D., Brown, K., Pizzini, E., and Shepardson, D.P. (1989). Gender differences in the science classroom. SSMA National Convention, Des Moines, IA.
6. Pizzini, E.L. and Shepardson, D.P. (1990). Extending science textbooks through problem solving. NSTA National Convention, Atlanta, GA.
7. Kotar, M., Abell, S., Barrow, L.H., Daus, D.R., O'Brien, G.E., Pizzini, E.L., Shepardson, D.P., Voyles, M., and Yupp-Edwards, R. (1990). Teaching teachers' elementary methods share-a-thon. NSTA National Convention, Atlanta, GA.
8. Shepardson, D.P. and Pizzini, E.L. (1990). Analysis of student interactions and behaviors during problem solving within the SSCS instructional model utilizing path analysis. NARST National Convention, Atlanta, GA.
9. Abell, S.K. and Shepardson, D.P. (1990). Promoting meaningful learning from science books. SSMA National Convention, Cincinnati, OH.
10. Shepardson, D.P. and Abell, S.K. (1991). Improving student learning from science textbooks. NSTA National Convention, Houston, TX.
11. Shepardson, D.P. (1991). Relationships among problem solving, student interactions, and thinking skills. NARST National Convention, Lake Geneva, WI.
12. Abell, S.K., Shepardson, D.P., and Campbell, L. (1992). Productive questions = productive investigations. NSTA National Convention, Boston, MA.
13. Shepardson, D.P. and Abell, S.K. (1992). Graphic representations. NSTA National Convention, Boston, MA.
14. Shepardson, D.P. (1992). The development of first graders' ideas about metamorphosis: The role of formal and informal learning. NARST National Convention, Boston, MA.
15. James, R.K., Shepardson, D.P., Skoog, G., Andrews, D., Druger, M., Atwater, M., Gilbert, S.W., Griffin, J., Germann, P., and Yeotis, C. (1993). NSTA's new standards for science teacher preparation. NSTA National Convention, Kansas City, MO.
16. Shepardson, D.P., Moje, E., Abell, S. (1993). Fourth graders' change in conceptual understandings of electric circuits. NARST National Convention, Atlanta, GA.
17. Shepardson, D.P. (1994). A framework and strategies for improving laboratory instruction and assessment at the middle school level. AETS Annual Meeting, El Paso, TX.
18. Shepardson, D.P. & Moje, E. (1994). The nature of fourth graders' understanding of electric circuits and the role of anomalous data. NARST National Convention, Anaheim, CA.
19. Shepardson, D.P., Krockover, G., & Kyle, W.C. (1994). Strategies for integrating computer technology into science classrooms. NSTA National Convention, Anaheim,



- CA.
20. Shepardson, D.P. (1994). An in-service model for improving laboratory instruction and assessment. NSTA National Convention, Anaheim, CA.
  21. Britsch, S.J. & Shepardson, D.P. (1994). The role of literacy in the construction of scientific understandings: The use of journals in elementary classrooms. AERA Annual Meeting, New Orleans, LA.
  22. Shepardson, D.P. (1995). An in-service model for changing teachers' assessment practice. AETS Annual Meeting, Charleston, WV.
  23. Shepardson, D.P. & Adams, P. (1995). Strategies for improving laboratory instruction and assessment. NSTA Annual Meeting, Philadelphia, PA.
  24. Shepardson, D.P. (1995). Coming to know and understand alternative assessment. NSTA Annual Meeting, Philadelphia, PA.
  25. Britsch, S.J. & Shepardson, D.P. (1995). The role of journals in children's construction of scientific understanding in elementary school classrooms. AERA Annual Meeting, San Francisco, CA.
  26. Shepardson, D.P. (1995). Twenty-four out of thirty = change. AERA Annual Meeting, San Francisco, CA.
  27. Shepardson, D.P. & Moje, E. (1995). Fourth graders' interpretive frameworks for understanding electric circuits. NARST Annual Meeting, San Francisco, CA.
  28. Shepardson, D.P., Adams, P., & Hendricks, R. (1996). Alternative assessment in science. NSTA Annual Meeting, St. Louis, MO.
  29. Shepardson, D.P., Adams, P., & Hendricks, R. (1996). Making laboratory instruction and assessment meaningful. NSTA Annual Meeting, St. Louis, MO.
  30. Shepardson, D.P. & Adams, P. (1996). Perspectives on assessment in science: Voices from the field. NARST Annual Meeting, St. Louis, MO.
  31. Shepardson, D.P. (1996). Teacher voices: Perspectives on assessment in science. AERA Annual Meeting, New York City, NY.
  32. Britsch, S.J. & Shepardson, D.P. (1996). Science journals: Tools for the construction of understanding. AERA Annual Meeting, New York City, NY.
  33. Shepardson, D.P. & Britsch, S.J. (1997). Using journals to teach science. NSTA Annual Meeting, New Orleans, LA.
  34. Shepardson, D.P., Kyle, W.G., & Adams, P.E. (1997). Theoretical perspectives for science education. NARST Annual Meeting, Chicago, IL.
  35. Britsch, S.J. & Shepardson, D.P. (1997). Children's uses of science journals in the context of classroom social interactions. AERA Annual Meeting, Chicago, IL.
  36. Krockover, G., Ridgeway, K., Eichinger, D., Nakhleh, M., Francisco, J., Shepardson, D., & Adams, P. (1998). Improving the preparation of k-12 teachers through reform of the undergraduate science content experience. NSTA Annual Meeting, Las Vegas, NV.

37. Shepardson, D.P. (1999). *Who I am*. The University of Iowa, Iowa City, IA
38. Shepardson, D.P., Bell, C., and others (2000). Share the wealth in environmental education. NSTA Annual Meeting, Orlando, FL.
39. Shepardson, D.P. and Britsch, S.J. (2000). Young children's representations of earth materials on the science journal page. NARST Annual Meeting, New Orleans, LA.
40. Cooper, B., Harbor, J., & Shepardson, D. (2000). Inquiry-based research as a science teaching model for grades 6-12. National Association of Geoscience Teachers Annual Meeting, Denver, CO.
41. Krockover, G.H. and Shepardson, D.P. (2001). Using action-based research teams to reform the college science curriculum. Association for the Education of Teachers of Science Annual Meeting, Costa Mesa, CA. **Note: Paper was nominated for best conference paper: Innovations in Teaching Science Teachers.**
42. Shepardson, D.P. and Bell, C. (2001). ENVISION. NSTA Annual Meeting, St. Louis, MO.
43. Shepardson, D.P. and Britsch, S.J. (2001). Zones of interaction: Granting differential levels of privilege. NARST Annual Meeting, St. Louis, MO.
44. Shepardson, D.P., Harbor, J., Meyer, J., & Koschman, M (2002). ENVISION. NSTA Annual Meeting, San Diego, CA.
45. Shepardson, D.P., Krockover, G., & Adams, P. (2002). Teachers as Scientists: Three Professional Development Strategies. NARST Annual Meeting, New Orleans, LA.
46. Shepardson, D.P. (2002). A Vision for CeMaST. Illinois State University, Normal, IL.
47. Shepardson, D.P. (2003). The Effectiveness of the ENVISION Professional Development Model. NARST Annual Meeting, Philadelphia, PA.
48. Shepardson, D.P., Harbor, J., Wee, B., & Fast, J. (2003). ENVISION: Teaching Environmental Science as Inquiry. NSTA Annual Meeting, Philadelphia, PA.
49. Britsch, S.J. & Shepardson, D.P. (2003). Scientific Literacy through Journaling: A Professional Development Project in the Elementary Classroom. AERA Annual Meeting, Chicago, IL.
50. Shepardson, D.P., Harbor J., Wee, B., & Fast, J. (2004). ENVISION. NSTA Annual Meeting, Atlanta, GA.
51. Shepardson, D.P. (2004). Where Animals Live: Students' Ideas about what is an Environment. NARST Annual Meeting, Vancouver, Canada.
52. Wee, B., Harbor, J., & Shepardson, D.P. (2005). Multiculturalism in environmental science education. NARST Annual Meeting, Dallas.
53. Shepardson, D.P., Harbor, J., & Wee, B. (2005). Trading places: teacher learners becoming mentor teachers. NARST Annual Meeting, Dallas.

54. Harbor, J., Shepardson, D.P., & Wee, B. (2005). Middle school teachers learning and teaching inquiry using investigations of local environments. Association of American Geographers (AAG) Annual Meeting, Denver.
55. Shepardson, D.P., Wee, B., Priddy, M., Schellenberger, L. & Harbor, J. (2006). Students' mental models of the environment. NARST Annual Meeting, San Francisco.
56. Britsch, S.J. & Shepardson, D.P. (2007). The Children's Literacy and Science Project: Helping Teachers Interpret Children's Multimodal Science Journaling. AERA Annual Meeting, Chicago.
57. Shepardson, D.P., Wee, B., Priddy, M., Walls, L., & Harbor, J. (2007). Mountains and Rain and Sheds and Towers: Students' Conceptions of Watersheds. NARST Annual Meeting, New Orleans.
58. Umarporn C., Niyogi, D., Shepardson, D., Souleymane, F., Sheeringa, K., Johnson, L., Brooks, A., & Basch, M. (2007). Utilizing the GLOBE, CoCoRaHS and National Weather Service data for regional Drought Assessments, Annual GLOBE Conference, San Antonio, TX.
59. Choi, S., Shepardson, D., Niyogi, D., & Umarporn, C. (2008). Earth and Environmental Science Textbooks' Coverage of Secondary Students' Concepts of Global Warming. NARST Annual Meeting, Baltimore, MD.
60. Shepardson, D.P. (2008). Precipitation, Evaporation, and Condensation: Student Conceptions of the Hydrologic Cycle. NARST Annual Meeting, Baltimore, MD.
61. Shepardson, D.P., Choi, S., Niyogi, D., Umarporn, C. (2009). Student Conceptions of Global Warming and Climate Change. NARST Annual Meeting, Garden Grove, CA.
62. Shepardson, D.P. (2009). Cognitive and Affective Conditions for Understanding Climate Change. Invited panel speaker, National Science Foundation workshop on Climate Change Education: Defining Needs and Key Issues, National Science Foundation, Arlington VA.
63. Shepardson, D.P. (2009). Students' Mental Models of Environmental and Earth Science Phenomena, NASA Goddard Space Flight Center, Washington DC.
64. Shepardson, D.P., Soyoung, C., Niyogi, D., Charusombat, U. (2010). Bouncing and trapping the sun's rays: seventh grade students' mental models of the greenhouse effect. NARST Annual Meeting, Philadelphia, PA.
65. Choi, S. & Shepardson, D.P. (2010). Seventh graders' concepts and ways of reasoning about the impact of global warming on tornados and hurricanes. NARST Annual Meeting, Philadelphia, PA.
66. Crawford, B., Luft, J., Lederman, N., Ling Tan, A., Liam, S., Shepardson, D.P., Okhee, L., & Loughran, J. (2011). Symposium: Supporting teachers in teaching science as inquiry: What is the evidence for effective professional development? NARST Annual Meeting, Orlando, FL.
67. Roychoudhury, A., Shepardson, D.P., Niyogi, D., Hirsch, A., Patton, B., Choi, S., & Maeda, Y. (2011). Symposium: Climate education research, perspectives, and issues. NARST Annual Meeting, Orlando, FL.

68. Roychoudhury, A. Shepardson, D.P., Patton, B., George, M., Burton, S., & Wilson, J. (2012). Symposium: Global warming and climate change: Perspectives on student learning and adaptation of instructional materials. NARST Annual Meeting, Indianapolis, IN.
69. Shepardson, D.P., Baker, A. Cutler, M., Schmitz, H., & Leuenberger, T. (2012). Contextualizing climate change within a climate system. NSTA Annual Meeting, Indianapolis, IN.
70. Shepardson, D.P. (2012). Students' conceptions of the greenhouse effect, global warming, climate change, and the Earth's climate system. RiSE 2012 National Summer Conference, The University of Maine, Orono, ME.
71. Shepardson, D.P. (2012). Teaching and learning about the Earth's changing climate system. RiSE 2012 National Summer Conference, The University of Maine, Orono, ME.
72. Niyogi, D., Ganesh, N., Singh, D., Shepardson, D.P., Roychoudhury, A., Hirsch, A., & Halversen, C. (2012). Assessment of U.S., Indian and Chinese middle school students' outlook on the greenhouse effect. American Geophysical Union Fall Meeting, San Francisco, CA.
73. Roychoudhury, A., Shepardson D.P., Wilson, J., Patton, B., McGinnis, J.R., Hirsch, A., Breslyn, W., Hesteness, E., and McDonald, C. (2013) Symposium--Climate Change Education: Teaching, Learning, and Assessment, National Association of Research in Science Teaching annual conference, Rio Grande, Puerto Rico.
74. McGinnis, J.R., Brickhouse, N., Breslyn, W., McDonald, C., Hesteness, E., Roychoudhury, A., Shepardson D.P., Patton, B., Hirsch, A., Wilson, J., and Parker, C. (2013) Symposium--The Policy, Practice, and Research Nexus of Climate Change Education, National Association of Research in Science Teaching annual conference, Rio Grande, Puerto Rico.
75. Shepardson, D.P. (2013). Student conceptions of the Earth's climate system and greenhouse effect. Geological Society of America annual meeting and expo, Denver, CO. (invited)
76. Roychoudhury, A., Strickhouser, N., Shepardson, D., & Hirsch, A., (2013). Conceptual facets of teaching climate change: university-based researchers' and teachers' experiences. Mid-Atlantic ASTE, Daniels, WV.
77. Strickhouser, N., Roychoudhury, A., Shepardson, D., & Hirsch, A. (2014). Collaboration with classroom teachers in conceptual model representation. ASTE annual conference, San Antonio, TX.
78. Strickhouser, N., Roychoudhury, A., Hirsch, A., & Shepardson, D. (2014). Bridging theory to practice: Student model of greenhouse effects in a ninth grade classroom. AAPT Winter Meeting, Orlando, FL.
79. Mehta, J., Roychoudhury, A., Hirsch, A., & Shepardson, D. (2014). Student models of weather, climate, and climate change. AAPT Winter Meeting, Orlando, FL.
80. Roychoudhury, A., Shepardson, D., Hirsch, A., Strickhouser, N., & Wilson, J. (2014). University-based Researchers' and Teacher-researchers' Perspectives on Developing

Curriculum Materials and Teaching Climate Change. AERA annual conference, Philadelphia, PA.

81. Roychoudhury, A., Shepardson, D.P., Hirsch, A., & Mehta, J. (2015). Teacher Pedagogical Framing in the Context of Teaching Climate Change. National Association of Research in Science Teaching annual conference, Chicago, IL.
82. Ghadiri Khanaposhtani, M., Pijanowski, B. & Shepardson, D.P. (2015) Teaching STEM to Middle School and Visually Impaired High School Students through Soundscape Ecology Modules in an Informal Learning Context. International Symposium for Sustainable Systems and Technology Annual conference, Dearborn, MI.
83. Hirsch, A., Shepardson, D.P., & Roychoudhury, A. (2017). A Symposium on Teaching and Learning about Climate Change: A Framework for Educators. National Association of Research in Science Teaching annual conference, San Antonio, TX.

c. Regional Meetings

1. Shepardson, D.P. and Brown, D. (1987). Infusing hydrocarbon concepts into the science curricula. NSTA Area Convention, Salt Lake City, UT.
2. Shepardson, D.P. and Brown, D. (1987). Teaching children about heat and temperature. NSTA Area Convention, Salt Lake City, UT.
3. Shepardson, D.P. and Dalton, E. (1987). Teaching energy in the classroom. NSTA Area Convention, Salt Lake City, UT.
4. Shepardson, D.P. and Dalton, E. (1987). Infusing technological and societal issues into the science curricula. NSTA Area Convention, Salt Lake City, UT.
5. Shepardson, D.P., Abell, S.K., and Pizzini, E.L. (1989). Strategies for improving student thinking utilizing science textbooks. NSTA Area Convention, Milwaukee, WI.
6. Pizzini, E.L. and Shepardson, D.P. (1989). Making textbook science come alive through problem solving. NSTA Area Convention, Milwaukee, WI.
7. Pizzini, E.L. and Shepardson, D.P. (1989). Making textbook science come alive through problem solving. NSTA Area Convention, Phoenix, AZ.
8. Pizzini, E.L. and Shepardson, D.P. (1990). SCS problem solving. NSTA Area Convention, Long Beach, CA.
9. Krockover, G.H., Shepardson, D.P., Moje, E., Reid, P., & Roth, M. (1995). Developing content for science and literacy assessment: The genetics of fruit flies. NSTA Area Convention, Salt Lake City, UT.
10. Shepardson, D.P. (1995). Teacher perspectives on alternative assessment. NSTA Area Convention, San Antonio, TX.

d. Other Presentations

1. Moore, J., Pizzini, E.L., and Shepardson, D.P. (1988). Project Sci-Tag: Science curricula for TAG students. Iowa Talented and Gifted Associations State Conference, Iowa City, IA.

2. Shepardson, D.P. (1990). Problem solving and science education. Integrating thinking skills into the science classroom, science supervisors' leadership conference. Science Education Center, The University of Iowa, Iowa City, IA.
3. Shepardson, D.P. (1991). Asking the right question. Hoosier Association of Science Teachers, Inc. State Conference, Indianapolis, IN.
4. Shepardson, D.P. and Mary Schwartz (1991). Teaching for Conceptual Understanding in Science. Presentation to the State Budget Committee, Purdue University, West Lafayette, In.
5. Shepardson, D.P. (1991). The Relationship Among Problem Solving, Student Interactions, and Thinking Skills. Research Seminar Series, Division of Vocational Education, Dept. of Curriculum & Instruction, Purdue University, West Lafayette, IN.
6. Abell, S. and Shepardson, D.P. (1991). Enhancing Elementary Science through Peer Instruction. Reform in Science, Mathematics, and Technology Education. School Mathematics and Science Center, Purdue University, West Lafayette, IN.
7. Shepardson, D.P. and Stensvold, M. (1992). Re-structuring laboratory instruction. HASTI Annual Convention, Indianapolis, IN.
8. Celichowski, M., Gladysmae, G., Hilton, B., Kobe, M., Krockover, G., Shepardson, D., and Vavrek, J. (1992). The Moscow experience. HASTI Annual Convention, Indianapolis, IN.
9. Abell, S.K., Shepardson, D.P., Bruns, M., Dietrich, M., Dodds, L., Sharp, K. (1992). Enhancing elementary science through peer leadership teams. HASTI Annual Convention, Indianapolis, IN.
10. Shepardson, D.P. (1992). Elementary students' conception of scientific concepts. Science and Mathematics Education Colloquia, Purdue University, West Lafayette, IN.
11. Shepardson, D.P. (1993). Children's ideas about insect life cycles. Research Seminar Series, Division of Vocational Education, Department of Curriculum & Instruction, Purdue University, West Lafayette, IN.
12. Shepardson, D.P. (1993). Project wild and other environmental education curriculum projects. Indiana Association of Colleges for Teacher Education, 46th Annual Conference, Turkey Run, IN.
13. Shepardson, D.P. & Moje, E. (1994). Children's conception of electric circuits. Research Seminar Series, Division of Vocational Education, Department of Curriculum & Instruction, Purdue University, West Lafayette, IN.
14. Shepardson, D.P., Stensvold, M., Emery, D., Jackson, V., Linton, E., Ruckman, C., Mitchell, R, & Scherer, R. (1994). INLAB--integrating laboratory instruction and assessment. HASTI Annual Convention, Indianapolis, IN.
15. Shepardson, D.P., Adams, P., Kasarjian, B., Jackson, V., & Ruckman, C. (1994). A framework for improving laboratory instruction and assessment. Indiana Department of Education, Mathematics/Science/Technology Conference, Indianapolis, IN.

16. Britsch, S.J. & Shepardson, D.P. (1994). The use of science journals by elementary children. Literacy and Language Seminar, Department of Curriculum and Instruction, Purdue University.
17. Shepardson, D.P. & Adams, P. (1994). An overview of project INLAB. Research Seminar Series, Division of Vocational Education, Department of Curriculum & Instruction, Purdue University, West Lafayette, IN.
18. Shepardson, D.P. & Britsch, S.J. (1995). Journal writing to learn science: How and why. HASTI Annual Convention, Indianapolis, IN.
19. Shepardson, D.P., Adams, P., Jackson, V., Linton, E., Ruckman, C., Mitchell, R., & Scherer, R. (1995). Integrating laboratory instruction and alternative assessment. HASTI Annual Convention, Indianapolis, IN.
20. Shepardson, D.P., Brewer, M., Edwards, M., Gropp, R., Hamilton, J., Jackson, V., Main, B., Naftzger, L., Shartrina, R., & Werner, K. (1996). Will rubric sink or float? HASTI Annual Convention, Indianapolis, IN.
21. Beardmore, K. & Shepardson D.P. (1996) Constructivism: What is it and what does it mean for the science classroom? HASTI Annual Convention, Indianapolis, IN.
22. Gummer, E. & Shepardson, D.P. (1997). Teacher enhancement through alternative assessment task development. School Mathematics and Science Spring Conference, Purdue University, West Lafayette, IN.
23. Gummer, E. & Shepardson, D.P. (1998). Teacher enhancement through alternative assessment task development. HASTI Annual Convention, Indianapolis, IN.
24. Gummer, E. & Shepardson, D.P. (1998). Standards-based alternative assessment tasks: Examples from the classroom. HASTI Annual Convention, Indianapolis, IN.
25. Gummer, E. & Shepardson, D.P. (1998). Standards-based assessment task development inservice program. School Mathematics and Science Center Spring Conference, Purdue University, West Lafayette, IN.
26. Shepardson, D.P. (1999). Study in a second discipline: An update. Division of Vocational Education, Department of Curriculum & Instruction, Purdue University, West Lafayette, IN.
27. McDonald, J., Shepardson, D., & Harbor, J. (2000). Environmental science institute for Indiana teachers. HASTI Annual Convention, Indianapolis, IN.
28. Shepardson, D., Harbor, J., & McDonald, J (2000). Teacher understandings and beliefs about water quality and watersheds. HASTI Annual Convention, Indianapolis, IN.
29. Cooper, B., Harbor, J., & Shepardson, D. (2000). Environmental research in the classroom. HASTI Annual Convention, Indianapolis, IN.
30. Krockover, G., & Shepardson, D. (2000). Developing action based research teams to reform your science program. HASTI Annual Convention, Indianapolis, IN.
31. Shepardson, D.P., Bell, C., Leuenberger, T., Harbor, J., Meyer, J., & Klaggs, H. (2001). ENVISION. HASTI Annual Convention, Indianapolis, IN.

32. Shepardson, D.P., Meyer, J., Harter, S., & Koschmann, M. (2001). ENVISION: Teachers as Scientists. Division of Vocational Education, Department of Curriculum & Instruction, Purdue University, West Lafayette, IN.
33. Shepardson, D.P., Meyer, J., Harbor, J., Klaggs, H., & Koschman, M. (2002). ENVISION. HASTI Annual Convention, Indianapolis, IN.
34. Shepardson, D.P. & Britsch, S.J. (2003). Link Literacy with Science through Journaling. HASTI Annual Convention, Indianapolis, IN.
35. Shepardson, D.P., Harbor, J., Wee, B., & Werth, J. (2003). ENVISION: An Environmental Science Professional Development Program. HASTI Annual Convention, Indianapolis, IN.
36. Shepardson, D.P., Harbor, J., Wee, B., & Fast, J. (2004). ENVISION. HASTI Annual Convention, Indianapolis, IN.
37. Shepardson, D.P., Harbor, J., Wee, B., Melton, W., & Priddy, M (2005). A case study of the ENVISION professional development model. Division of Vocational Education, Department of Curriculum & Instruction, Purdue University, West Lafayette, IN.
38. Hill, J., Benak, D., Boehler, P., Krockover, G., & Shepardson, D.P. (2005). District-wide Science and Math Reforms. The 8<sup>th</sup> IUPUI/IUSA Summer Conference on Urban Education, Indianapolis, IN.
39. Shepardson, D.P., Wee, B., Walls, L. (2006). Students' Mental Models of the Environment. Division of Vocational Education, Department of Curriculum & Instruction, Purdue University, West Lafayette, IN.
40. Shepardson, D.P. (2007). Students' Conceptions of Watersheds. Division of Vocational Education, Department of Curriculum & Instruction, Purdue University, West Lafayette, IN.
41. Shepardson, D.P., Niyogi, D., Choi, S. & Charusombat, U. (2008) Teaching and Learning about Climate Change, Lily Partners in Education Workshop, Celery Bog Nature Center.
42. Shepardson, D.P., Niyogi, D., Choi, S. & Charusombat, U. (2008) Teaching about Climate Change, HASTI Annual Convention, Indianapolis, IN.
43. Shepardson, D.P. (2008). Environmental Education: Opportunities and Challenges. Indiana Environmental Education Symposium, Indianapolis, IN. (Invited keynote speaker)
44. Greene, J. & Shepardson, D. (2008). Grant Writing. Division of Vocational Education, Department of Curriculum & Instruction, Purdue University, West Lafayette, IN.
45. Shepardson, D.P., Niyogi, D., Choi, S. & Charusombat, U., Leuenberger, T., Burch, D., Koschmann, M. (2009). Activities for Conceptualizing Climate and Climate Change. HASTI Annual Convention, Indianapolis, IN.
46. Shepardson, D.P. (2009). Family Environmental Fun Packs. Wednesday in the Wild, West Lafayette Parks and Recreation, West Lafayette, IN.
47. Shepardson, D.P. (2009). Energy and Climate. Purdue Conference on Indiana P-12



- Energy Education: Raising the Energy Level. Purdue University, West Lafayette, IN.
48. Shepardson, D.P. (2009). Activities for Conceptualizing Climate and Climate Change. Environmental Education Association of Indiana Annual Conference, Milford, IN (Invited).
  49. Roychoudhury, A., Shepardson, D.P., Hirsh, A., & Choi, S. (2010). Exploratory Study of Middle School Students' Knowledge about Global Warming. HASTI Annual Convention, Indianapolis, IN.
  50. Shepardson, D.P. (2010). Climate Change Education. Environmental Education Association of Indiana Annual Conference, Shakamak State Park, IN. (Invited).
  51. Shepardson, D. (2010). Students' Mental Models. Division of Vocational Education, Department of Curriculum & Instruction, Purdue University, West Lafayette, IN.
  52. Shepardson, D.P. (2011). Developing a Drought Curriculum. Symposium on Data-Driven Approaches to Droughts, Purdue University, West Lafayette, IN (invited).
  53. Shepardson, D.P. (2011). Developing a Climate Science Education Professional Development Program, Climate Services Workshop, National Weather Service, Indianapolis, IN (invited).
  54. Shepardson, D.P. (2011). Secondary Students' Conceptions of the Greenhouse Effect, Global Warming, and Climate Change, Purdue University Green Week, West Lafayette, IN (invited).
  55. Shepardson, D.P. (2012). Student drawings as a primary data source. EDCI Doctoral Seminar, Purdue University, West Lafayette, IN.
  56. Britsch, S. and Shepardson, D.P. (2012). English learners visualizing science: The chain of semiosis. Division of Vocational Education, Department of Curriculum & Instruction, Purdue University, West Lafayette, IN.
  57. Shepardson, D.P. (2013). A virtual tour of the natural history of Glacier National Park. Armchair Series, Department of Earth, Atmospheric, and Planetary Sciences, Purdue University, West Lafayette, IN.
  58. Shepardson, D.P. (2013). Glacier National Park: The Crown of the Continent. Wednesday in the Wild series, Lilly Nature Center, West Lafayette, IN.
  59. Shepardson, D.P., Cutler, M., Leuenberger, T., Schmitz, H., Kellner, O. & Niyogi, D. (2014). The dynamics of climate: A toolkit for teacher professional development. HASTI Annual Convention, Indianapolis, IN.
  60. Shepardson, D.P. (2014). Photographing nature. Wednesday in the Wild series, Lilly Nature Center, West Lafayette, IN.
  61. Shepardson, D.P. (2014). Mental, Conceptual, and Physical Models. EDCI Doctoral seminar, Purdue University, West Lafayette, IN.
  62. Shepardson, D.P. (2014). Yellowstone: Land of Fire, Ice, Water, and Wildlife. Wednesday in the Wild series, Lilly Nature Center, West Lafayette, IN.

63. Yacinthe, A., Morison, N., Orme, C., Rhine, A., Loudon, C., Busse, R., Brown, A., & Shepardson, D.P. (2015). The Pollinator Project. Wednesday in the Wild, Lilly Nature Center, West Lafayette, IN.
  64. Roychoudhury, A., Shepardson, D.P., & Hirsch, A. (2016). Teaching a Complex Topic—Climate Change. Indiana STEM Education Conference, Purdue University, West Lafayette, IN.
  65. Shepardson, D.P. (2016). What is Environmental Education? Department of Forestry and Natural Resources, Purdue University, West Lafayette, IN.
  66. Shepardson, D.P. (2016). Celebrating the 100<sup>th</sup> Anniversary of the National Park Service and Our National Parks. Wednesday in the Wild, Lilly Nature Center, West Lafayette, IN.
  67. Shepardson, D.P. (2016). A Place Called Turkey Run. Wednesday in the Wild, Lilly Nature Center, West Lafayette, IN.
  68. Shepardson, D.P. (2016). Student Drawings as a Primary Data Source. Discipline Based Educational Research, Purdue University, West Lafayette, IN.
  69. Shepardson, D.P., Roychoudhury, A., & Hirsch, A. (2017). Students Conception of a Climate System. Indiana STEM Education Conference, Purdue University, West Lafayette, IN.
  70. Shepardson, D.P. (2017). A Place Called Turkey Run. Friends of Turkey Run, Turkey Run Inn, Turkey Run State Park, IN.
  71. Shepardson, D.P. (2017). Photographing Nature. Wednesday in the Wild, Lilly Nature Center, West Lafayette, IN.
  72. Shepardson, D.P., Roychoudhury, A., & Hirsch, A. (2017). Students Conception of a Climate System: Implications to Teaching and Learning. Division of Vocational Education, Department of Curriculum & Instruction, Purdue University, West Lafayette, IN.
  73. Shepardson, D.P. (2018). Planting for Pollinators and Photography. Wednesday in the Wild, Lilly Nature Center, West Lafayette, IN.
  74. Shepardson, D.P. (2020). Yellowstone: A Journey through Time. Wednesday in the Wild, Lilly Nature Center, West Lafayette, IN.
  75. Shepardson, D.P. & Hirsch, A. (2020). Climate change, are we doing enough in the classroom? Class Dismissed Podcast #140:  
<https://podcasts.google.com/?feed=aHR0cHM6Ly9jbGFzc2Rpc21pc3NiZHBvZGNhc3QuY29tL2ZlZWQv&episode=aHR0cHM6Ly9jbGFzc2Rpc21pc3NiZHBvZGNhc3QuY29tLz9wPTUwMTg&hl=en&ved=2ahUKEwj-so-YjZjoAhUjHDOIHyoZBkoQieUEegQICxAG&ep=6>
  76. Shepardson, D.P., Pawley, A., & Haugen, L. (2020) Climate Change in the Curriculum. PCCRC, Panel Series, Purdue University, West Lafayette, IN.
7. Evidence of Involvement in Graduate Research Program
    - a. Chairperson, Current Ph.D.

1. Edith Gummer, Ph.D. Science Education (2000). **Dissertation received the C&I Outstanding Dissertation Award**
  2. Cheryl Bell, Ph.D. Science Education (2002)
  3. Bryan Wee, Ph.D. Geoscience Education (2006). **Recipient of the Wilson Doctoral Scholarship, Bilsland Fellowship, and Bilsland Strategic Initiatives Fellowship**
  4. Soyoung Choi, Ph.D. Geoscience Education (2011), **Recipient of the Wilson Doctoral Scholarship**
  5. Amy Gillan (2011), Ph.D. Geoscience Education
  6. Umarporn Charusombat (2012), Ph.D. Geoscience Education (co-chair)
  7. Lindsey Payne (2015), PhD Ecological Sciences and Engineering (co-chair) **Recipient of the Bilsland Dissertation Fellowship and student responder at the Summer Commencement**
  8. Christopher Roemmele, PhD Geoscience Education (2017). **Recipient of the Bilsland Doctoral Fellowship (2015), EAPS Graduate Fellowship for K-12 Outreach (2015, 2016, 2017), EAPS Outstanding Graduate Student Award (2017), EAPS Graduate Student Expo Outstanding Presentation Award (2017), and Purdue University Teaching Academy (2017)**
  9. Maryam Khanaposhtani, PhD Forestry and Geoscience Education (co-chair) (2018)
  10. **Israt Ferdous, PhD, Science Education and Ecological Sciences and Engineering**
- b. Chairperson Ed.S, MS., MS Ed.
1. Rick Mitchell (1996). MS Science Education, Purdue University
  2. Rebecca Pekarek (1997). MS Science Education, Purdue University (**MS paper received the 1997 Ann Patterson Award**)
  3. Amy Mugg (1999). MS Science Education, Purdue University
  4. Gail Kidd (2001) MS Elementary Education, Purdue University
  6. Juli Werth (2003) MS Science Education, Purdue University
  7. Frank Arnold (2004, co-chair) MS Science Education, Purdue University
  8. Michelle Priddy (2006), MS Science Education, Purdue University (**Recipient of an ICC 2005 Community Service Mini-grant for her master's project**) (Life Science Education Specialist, Life Science Education Center and EcoLab, Marian College)
  9. Dane Brown (2009), MS Geoscience Education, Purdue University
  10. Julia Young (2016), MS Science Education, Purdue University
  11. Mi Yen Kim (2016), MS Geoscience Education, Purdue University
- c. Ph.D. and MS Committee Member:
1. Ketterling, Gary (1992). Instruction in a problem solving model: Behavioral effects on middle school science teachers after three years. The University of Iowa, Ph.D. Dissertation.
  2. Yang, Ma Tzu-Lin (1992). An investigation of cultural variations in Chinese and American arithmetic learning contexts. Purdue University, Ph.D. Dissertation.
  3. Brenda Kasarjian (1993), MS Elementary Science Education, Purdue University
  4. Deborah S. Teuscher (1994), MS Earth Space Science Teaching, Purdue University
  5. Steve Hawkins (1994), MS Elementary Science Education, Purdue University
  6. Maria Anderson (1996), MS Elementary Science Education, Purdue University
  7. Rachel Hendrixs (1995), MS Science Education, Purdue University
  8. William S. Walker (1995), MS Mathematics Education, Purdue University
  9. Kelly Lockard (1995), MAT Elementary Education, Purdue University
  10. Paul Adams, (1996), Beginning teacher cognition: A case study of four secondary science teachers, Purdue University, PhD Dissertation. (**Note: Dissertation received the Department of Curriculum and Instruction Outstanding Dissertation Award**)

11. Marie Roth (1996) MS Science Education, Purdue University
12. Kathleen Falconer (1996) MS Science Education, Purdue University
13. Laura Staly (1996) MS Science Education, Purdue University
14. Melissa George (1998) MS Science Education, Purdue University
15. Debra Klich (1999) MS Science Education, Purdue University
16. Jason Meyer (2001) MS Forestry and Natural Resources, Purdue University
17. Bryan Wee (2001) MS Forestry and Natural Resources, Purdue University
18. Angela Henderson (2001) MS Science Education, Purdue University
19. Martha Hill (2002) PhD Science Education, Purdue University
20. Amanda Hopkins (2002) MS Science Education, Purdue University
21. Lana Zimmer (2003) MS Science Education, Purdue University
22. Kim Keesling (2003) MS Science Education, Purdue University
23. Jeff Studebaker (2003) MS Science Education, Purdue University
24. Nicole O'Leary (2004) MS Science Education, Purdue University
25. Chong-Wah Liew (2004) PhD Science Education, Curtin University of Technology, AU
25. Sarah Freemyer (2005) MS Science Education, Purdue University
26. Barbara Reger (2006) PhD Educational Psychology, Purdue University
27. Pablo Roman (2007) PhD Science Education, Purdue University
28. Heeraman Sookraj (2008) PhD Science Education, Curtin University of Technology, AU
29. Loran Carolton (2009) PhD Science Education, Purdue University
30. Samiksha Pohjouskawa (2009) MS Science Education, Purdue University
31. Sarah Schlosser (2012), PhD Science Education, Purdue University
32. Dane Brown (2012) MS STEM Rural, Purdue University
33. Dan Sacre (2012) MS STEM Rural, Purdue University
34. Ying Zhang (2013) PhD Literacy Education, Purdue University
35. Lorna E. Jarrett (2013), PhD. Science Education, University of Wollongong, AU
36. Chelsey Dankenbring (2014), MS Science Education, Purdue University
37. Darryl Reano (2014), MS Earth and Atmospheric Sciences, Purdue University
38. William Ehresman (2014), MS Science Education, Purdue University
39. Kelsey Crane (2014), MS Geoscience Education, Purdue University
40. Jignesh, Vidyut, MS (2016) and PhD (2017) Science Education, Purdue University
41. Becca Busse, (2018) MS Forestry and Natural Resources, Purdue University
42. Mingla Charoenmuang, (2020) PhD Youth Development and Agriculture Ed
43. Shamila Janakiraman, (2020) PhD LDT
44. Kendra Nunan, (2020) MS, Science Education

#### 8. Research and Training Grants Received

Awarded 19 externally funded grants, as PI, Co-PI, or Director from state Eisenhower programs, Indiana Department of Education, Indiana Commission for Higher Education, NSF and private foundations, totaling over \$10,000,000. I have also received over \$142,000 in internal funding from Purdue University for various projects.

1. Project SCI-TAG, Science for the Talented and Gifted, \$51,550. State Board of Regents EESA Title II program, 1987-88.
2. Project WISE, Women in Science and Education, \$33,670. State Board of Regents EESA Title II program, 1988-89.
3. Project UPSSTAT, Using Problem Solving in Science Teaching and Training, \$52,653. State Board of Regents EESA Title II program, 1989-90.
4. Enhancing Elementary Science through Peer Leadership Teams. A Cooperative Project of Purdue University and Tippecanoe School Corporation, \$59,552. Indiana Commission

- for Higher Education, Eisenhower program, 1991-92.
5. Establishing a National Clearing house for Science, Mathematics, and Technology Education, \$3,150. Purdue University Incentive Grant, 1991.
  6. The Impact of Cooperative Small Group Instruction in Science on Children's Scientific Understanding and Thinking. Purdue University, Undergraduate Research Trainee Award, 1991.
  7. Facilitating an Agenda for Reform in Science Education, \$50,000. Indiana Commission for Higher Education, Eisenhower program, 1992-93.
  8. Promoting the Effective Use of Computers in Science Teaching, \$3,250. Purdue University Proposal Development Incentive Grant, School of Education, 1992.
  9. Purdue Research Foundation Summer Faculty Grant, 1992, \$5,000. Science Instruction and its Potential impact on Student Thinking.
  10. Establishing a reform agenda in science, mathematics, and technology education through a state-wide conference, 1992-93, \$15,000. Indiana Department of Education.
  11. INtegrating LABoratory instruction and assessment (INLAB), 1992-1995, \$628,821. National Science Foundation.
  12. Systemic Reform in Science Education, 1993-94, \$50,000. Indiana Commission for Higher Education.
  13. The Role of Literacy in the Construction of Scientific Understanding: The Use of Journals in Elementary Classrooms. Purdue University, Undergraduate Research Trainee Award, 1993, in collaboration with Professor Susan Britsch.
  14. Teacher Education Equity Project (\$750). Teacher Education Equity Project, CUNY Graduate Center.
  15. The Role of Journals in the Construction of Scientific Understandings in Elementary Classrooms. Purdue University, Undergraduate Research Trainee Award, 1994, in collaboration with Professor Susan Britsch.
  16. The Role of Journals in the Construction of Scientific Understandings in Elementary Classrooms. Purdue University, Undergraduate Research Trainee Award, 1995, in collaboration with Professor Susan Britsch.
  17. Identifying Characteristics of the Multi-age Intermediate Classroom that Foster Successful Learning for Children, 1996, \$1,000. School of Education, Purdue University, PDS Minigrant. Co-PI.
  18. Teacher Enhancement Through Alternative Assessment Task Development, 1997-98, \$70,493.00. Indiana Commission for Higher Education.
  19. Faculty Program of Study in a Second Discipline (\$3,500). Proposal for collaborating with Professor Jon Harbor in Earth and Atmospheric Sciences in the study of wetlands environments, EVPAA Ringle (Spring Semester, 1999).
  20. Multimedia Instructional Development Grant (\$18,238). Proposal for instructional

development of a multimedia tool for campus-wide teaching of geographic information systems (GIS) in collaboration with W.L. Mills, Shao Guofan, Bernie Engel, Jon Harbor, and Jane Frankenberger. Multimedia Instructional Development Center, Purdue University.

21. Using Local Geoenvironmental Research Projects to Achieve National Science Education Standards: A Pilot Summer Course for In-Service Teachers, 8/1/98-5/31/2000 (\$88,369). With Barb Cooper (IUPUI) and Jon Harbor. The project improves the quality of science teaching and achieves the National Science Education Standards by exposing science teachers to inquiry and research-based education and pedagogy. National Science Foundation.
22. Environmental Science Institute for Indiana Teachers (\$80,645). With Jon Harbor. The project improves the quality of science teaching by developing high school science teachers' content, pedagogy, and assessment knowledge through the investigation of environmental issues. Indiana Commission for Higher Education, 1/1/99-5/31/2000.
23. ENVISION, 5/31/99-6/1/2005 (\$1,188,553). With Jon Harbor. ENVISION is a regional environmental science institute for teachers, developing teachers' content, pedagogy, and assessment knowledge in the areas of watershed science, waste management, and urban and built environments. NSF Teacher Enhancement.
24. PRF International Travel Grant (\$1,190) for presenting at the third International Conference on Geoscience Education, Sydney, Australia.
25. Environmental Science Institute for Indiana Teachers (\$66,484). The project improves the quality of science teaching by developing high school science teachers' content, pedagogy, and assessment knowledge through the investigation of environmental issues. Indiana Commission for Higher Education, 1/1/01-5/31/02.
26. Undergraduate Instructional Equipment proposal (\$14,734). To purchase science laboratory equipment for use by EDCI 365 students. Purdue University.
27. Children's Literacy and Science Project (CLASP) (\$160,000). The project works with elementary teachers on the integration of science and literacy using children's self-produced journals. Toyota USA Foundation, 1/1/02-12/31/06.
28. Undergraduate Instructional Equipment proposal (\$13,244). To purchase science laboratory equipment for use by EAS 312 students. Purdue University.
29. Encouraging Technology and Hands-on Science in Elkhart (\$80,306 subcontract, \$190,238 cost share; \$509,691 total award). CoPI's Gerald Krockover and Daniel Shepardson. Indiana Department of Education, Mathematics and Science Partnerships, 5/1/05-4/30/08.
30. Web-based Case Studies for Learning about Watersheds (\$14,985). Teaching & Learning Technology Grant, ITaP, Purdue University, 5/1/06-5/1/07.
31. Developing Activities for Conceptualizing Climate and Climate Change (\$149,467). D.P. Shepardson (PI) and Dev Niyogi (CoPI). NSF, GeoSciences, 8/31/06-8/31/09.
32. Go With the Flow—Development of Inquire-Based Curriculum Using a Systems Thinking and Concept Centered Approach, Clark Gedney (PI) and D.P. Shepardson, Indiana Commission for Higher Education, \$136,386.
33. Developing Activities for Conceptualizing Climate and Climate Change (\$10,000). D.P.

- Shepardson (PI) and Dev Niyogi (CoPI). CRESME (\$5,000) and Center for the Environment (\$5,000), Purdue University.
34. Family Environmental Education Packs (\$2,000). D.P. Shepardson. A Service Learning Faculty Development Grant, Purdue University. Developing 3 family education packs in collaboration with EDCI 506 students.
  35. Secondary Students' Ways of Reasoning about Environmental Issues (\$16,300). D.P. Shepardson. Purdue Research Foundation Research Grant (6/1/08-5/31/09).
  36. A prototype for integrating technology in middle school climate change curriculum (\$38,000) D. Niyogi (PI) & D.P. Shepardson (CoPI). Discovery Learning Center Seed Grant (6/1/08-5/31/09).
  37. Equipment for EAS 312 Field Trips (\$2,678), COS Instructional Materials and Equipment Grant (6/1/2010).
  38. Equipment for EAS 312 Alternative Energy Lab (\$3,700), COS Instructional Materials and Equipment Grant (4/9/2012).
  39. Making Sense of Global Warming: Model of Student Learning via Collaborative Research (\$1,568,132, plus a \$93,281 supplement). A. Roychoudhury (PI), D.P. Shepardson, B. Capobianco, A. Hirsch, & D. Niyogi (CoPIs). NSF (2008-2013).
  40. Developing an Earth System Science Teacher Professional Development Tool Kit (\$149,862). D.P. Shepardson (PI) and D. Niyogi (CoPI). NSF (2010-13).
  41. Integrating Smartboard and Tablet Technology into EAPS 312000 (\$38,153) CoS Technology Grant (6/18/2013-14).
  42. Soundscapes: Science, Engineering and Education Research to Preserve Earth's Acoustic Heritage. (\$300,000), OVPR Emerging Research Incentive Grant Program (7/25/2013-5/31/2016). CoPI.
  43. Practicing Critical STEM Literacy among Asian Transnational Youth (\$25,000). M. Ryu (PI), W. Wright, D.P. Shepardson, & T. Morita-Mullaney (CoPIs). COE Category I Launch the Future Incentive Grant.
  44. IMPACT grant (\$10,000). Purdue University, IMPACT Program (2016)
  45. Content Thematic Units for Integrated STEM Education (\$246,632) in collaboration with COS Science Outreach and Lafayette School Corporation, IN MSP (2014-17).
  46. Global Soundscapes! The Big Data, Big Screens, Open Ears Project (\$1,997,088). B. Pijanowski (PI) and B. Lisle, D.P. Shepardson, and C. Song (CoPIs). NSF (2013-2017, 2018-19 no cost extension).
  47. Dynamics of Climate Workshop (\$500). D.P. Shepardson (PI). EEAI (2020, postpone to April 2021 because of COVID-19).
  48. PCCRC's Teacher Development Program for Designing Climate Change Curriculum (\$10,000). D.P. Shepardson (PI), R. Filly and M. Widhalm (CoPIs). Duke Energy Foundation (2021).

## 9. Current Research Interests and Projects in Process

***Students' understandings and reasoning (conceptualization).*** This area of research deals with the effect of social interactions and group collaboration on students' ways of reasoning and construction of meaning, investigating how interpreting data, especially data that is anomalous to their conceptual framework influences their science learning.

***Journals as a medium for thinking and understanding.*** This is a collaborative research activity with professor Britsch, Literacy Education, designed to investigate children's use of journals as a medium for integrating their emerging literacy skills with their understandings of science phenomena and concepts as constructed in the classroom. Specifically: How does the teachers' structure of science activities influence children's strategies of journal use in their construction of science understandings? How does the nature of the children's social interactions in small-group science activities influence the content of their journals and, in turn, their scientific understandings and literacy development?

***Visualizing Nature Project.*** The *Visualizing Nature* project is a blend of landscape and nature photography that integrates the photographic image and written word to visualize nature. *Visualizing Nature* provides an opportunity to document nature and natural landscapes over time, both locally and nationally through photographs and text. Through the visualization of nature, the project seeks to change individuals' thoughts, emotions, and understandings of the natural world; to promote its preservation, as well as its enjoyment. *Visualizing Nature* uses the power of the photographic image to convey a visual perception of nature, to showcase the natural landscapes that make up our planet. It is a visual and powerful means to storytelling that supports the preservation and protection of our environment. It draws from the inherent appeal and popularity that individuals have toward photographs to create photographic exhibits that allow individuals the opportunity to see and appreciate nature. *Visualizing Nature* website: <http://www.eaps.purdue.edu/research/visualizing-nature/index.html>

## 10. Evidence of Interdisciplinary Activity

Collaborating with professor Britsch, Literacy and Language Education, on research on children's strategies for using journals in the construction of understandings of science phenomena and emerging literacy skills (1993-Present). This work has resulted in the funded Children's Literacy and Science Project (CLASP) by the Toyota USA Foundation (1/1/02-12/31/03)

Collaborated with faculty from the Schools of Science and Agriculture on the development of a web site-based, GIS instructional tool. The development of the site is supported by a University MID grant (2000).

Faculty Program of Study in a Second Discipline (1998-99). Proposal for collaborating with Professor Jon Harbor in Earth and Atmospheric Sciences in the study of wetlands environments was approved by EVPAA Ringle (11/4/97). The plan of study will develop my research and teaching expertise in wetlands science. This area of study is essential to enhancing both my science content knowledge and pedagogy, enabling me to remain competitive in seeking external funding. The program of study will have direct impact on my undergraduate teaching of EDCI 506/FOR 564 by allowing me to integrate the study of wetlands and pedagogical models for teaching about wetlands into this course. This experience will also lead to collaboration in the development of an undergraduate environmental science and education course, and the development of collaborative proposals for external funding. Thus, the study in a second discipline will allow me to extend my scholarship through interdisciplinary collaborations in teaching, research, and proposal development in an area related to my professional efforts.



Prairie Curriculum Project (1997-2000). I am collaborating with the U.S. Fish & Wildlife Service in the development of a prairie curriculum. Responsibilities include: directing the curriculum writing, field testing and revising process; collaborating in the writing of the curriculum; advising Barb Hossler, USF&W project director; and assisting in developing the conceptual framework and curricular matrix for guiding the curriculum development process. Consultant to the School of Agriculture's elementary school agriculture proposal (1990) Member, Environmental Education Group, provided input on the development of an EPA environmental education proposal which involved faculty from School of Agriculture, Natural Resources Research Institute, Dept. of Agricultural Engineering, and Water Resources Research Center (1992)

Collaborated with faculty from the Department of Earth and Atmospheric Science in the development of an Earth Science education proposal for American Indians (1992)

Have collaborated with professors Neie, Krockover, Nakhleh, and Eichinger in the Systemic Reform in Science Education project (1993-94).

Have involved faculty from Biology (Professor Eichinger), Physics (Professor Neie), Chemistry (Professor Nakhleh), and Earth and Atmospheric Science (Professor Krockover) in NSF funded project INLAB (1992-95)

Assessment/Evaluator (1997-98) for the NSF project "Collaborative Action Based Research Science and Mathematics Partnerships for Excellence in k-12 Teacher Preparation: A Pilot Program" (Gerald Krockover, Louis Sherman, & Kenneth Ridgeway, PIs).

Collaborator, Living Laboratories on the Wabash (LLOW) Project, Kim Wilson (PI), Linda Prokopy (Co-PI) and Laura Bowling (Co-PI). \$68,421, Center for the Environment, Purdue University. The project goal is to establish a "living laboratory" on the Wabash River that integrates discovery, learning, and engagement as a model for other river communities.

Collaborated on the Issue Based Action Team proposal submission and funded project, Purdue Extension, developing a climate change education program for Extension Educators. The project is under the direction of Hans Schmitz, Purdue Extension and Dev Niyogi, Indiana Climate Office (2012-14).

Advisory Board (2019-2020). Sustainable Food Systems project. National Institute of Food and Agriculture, U.S. Department of Agriculture, award number 2016-38640-25381 through the North Central Region SARE program, project number GNC18-256.

Collaborated on the Indiana Department of Education, Purdue Climate Change Research Center (PCCRC) and Purdue University College of Science new Climate Change Education Framework (2020/21). The Indiana Climate Change Education Framework offers easily accessible and scientifically curated instructional resources to educators interested in infusing their curriculum with information about climate change. IDOE and Purdue partners began curating resources that assist educators with teaching climate change while intersecting with existing Indiana Academic Standards for science. To guide this process, the team pulled from the published work of Purdue professors Dan Shepardson and Andrew Hirsch that outlines five critical climate change topics that provide a strong scientific foundation for continued learning.

Advisory Board, BSCS, middle school climate change curriculum development project (2020-23). Provide feedback and guidance on the development of the curricular framework and Curriculum for the Weather, Climate & Water Cycling unit.

## 11. Other Evidence of National or International Activity

NSF proposal reviewer, Antarctic Education Program, 2016  
 Editor, Journal of Computers in Mathematics and Science Teaching, 1992-1996  
 Associate Editor, Journal of Research in Science Teaching, 1993-1998; JRST Awards Committee, 1994-95; Editorial Board JRST, 2001-06; NARST Research Committee, 2005-07, Reviewer JRST 2006-Present.  
Journal of Science Teacher Education, Editorial Board, 1992-1997; reviewer 1990-1992; Associate Editor, 2008-2012.  
 Reviewer, School Science and Mathematics, 1990-Present  
Science Education, reviewer 1991-1993; Board of Reviewers, 2002-2020  
 Reviewer, International Journal of Science and Mathematics Education, 2004-2020  
Reviewer, Environmental Education Research, 2006-Present  
 National Science Teachers Association, Science Teacher Education Committee, 1991-1993  
 Association for the Education of Teachers in Science, Membership Committee (1991-1992); Publications Committee (1997-2000); Equity Committee (2001-03)  
 Advisory Board, ED Tech Review, 1993-1995  
 AERA program proposal reviewer, 1995, 1996, 1997  
 NARST program proposal reviewer, 1995, 1996, 2001, 2002, 2003, 2004, 2005, 2006, 2007  
 School Science and Mathematics Association, Nominations and Elections Committee, 1999-2002  
 Reviewer, Kluwer Academic Publishers, 2001-2005  
 Reviewer, Environmental Conservation, 2006-2010  
 Reviewer, Journal of Geoscience Education, 2006-2020  
 Reviewer, International Journal of Global Warming, 2010  
 Reviewer, Science Communication, 2010  
 Field Contributor, The Nature Photographer, 2007-2017  
Reviewer, The Journal of Environmental Education, 2014-present

## D. EXCELLENCE IN CONTINUING EDUCATION AND SERVICE

### 1. Description of Major Programs Associated with

Co-Director (1990-1992), Enhancing Elementary Science Through Peer Leadership Teams. A Cooperative Project of Purdue University and Tippecanoe School Corporation  
 Co-Director (1992-1993), Facilitating an Agenda for Reform in Science Education.  
 Co-Director (1992-93), Establishing a Reform Agenda in Science, Mathematics, and Technology Education Through a State-Wide Conference  
 Co-Director (1993-1994), Systemic Reform in Science Education. The project is working with elementary teachers from the Crawfordsville, Brownsburg, and Franklin school district and involves both assisting teachers in conceptualizing science content and developing conceptually based instruction.  
 Director (1992-1996), project INLAB. NSF Teacher Enhancement project for improving the quality and integrating laboratory instruction and assessment at the middle grades (4-9) (see file for description of project and current progress). The project includes 6 academic year workshops and a 3-week summer institute for each year of the 4 years of operation.  
 Director (1997-1998), Teacher Enhancement Through Alternative Assessment Task Development. The project involved middle level and high school science teachers in the development of alternative assessment task development, incorporating 1 spring (1997) workshop, a 2 week June 1997 workshop, 2 fall (1997) and spring (1998) workshops, and a 1 week June 1998 workshop.

- Director (1999-2000), Environmental Science Institute for Indiana Teachers. The institute involved middle and high school teachers and pre-service teachers in learning about watersheds and water ecosystems as well as learning the skills and techniques for conducting environmental field studies. Pedagogical and assessment strategies were also address during the Institute's workshops to facilitate classroom implementation.
- Co-Director (1999-2000), IUPUI Geoenvironmental Education program. The program involved middle and high school teachers in learning about watersheds and water ecosystems as well as learning the skills and techniques for conducting environmental field studies through investigating the Crooked Creek watershed. Pedagogical and assessment strategies were also address during the program's workshops to facilitate classroom implementation.
- Directors (1999-2005), ENVISION project. The project involves middle school teachers from across the Midwest in learning about environmental science concepts and issues related to watersheds, rural environments, and urban and built environments. Teachers design and conduct research projects investigating a local environment. Teachers also design inquiry-based lessons and activities for use in their classroom.
- Co-Director (2001-05), Children's Literacy and Science Project (CLASP). The project involves elementary teachers from the surrounding school corporation in learning about integrating science and literacy through the use of children's journals. Teachers design curriculum and develop case studies of practice. The CLASP web site disseminates information about the project, research, and professional development activities.

### 3. Principal Conferences and Workshops Organized

- Dynamics of Climate workshop, Lilly Nature Center, sponsored by EEAI, PCCRC, & TCP&R, April 3, 2020 (40 informal and formal educators)
- The Nature of Science: Moving Beyond Misconceptions, Annual Educator Workshop, Lilly Nature Center, June 14, 2016
- Dynamics of Climate workshop, Indiana Master Naturalist Program, Lilly Nature Center, March 9, 2016
- Chair, Center for the Environment, Environmental Education Retreat. Wright Center, Oct 9, 2015.
- Director, *The Dynamics of Climate* Conference for secondary teachers was held on June 18-20, 2014. The conference utilized speakers and breakout sessions (for modeling and guided practice). The conference prepared secondary teachers to use the toolkit to deliver teacher professional development and to enhance classroom instruction. The Purdue Climate Change Research Center (PCCRC) and the Center for the Environment (C4E) collaborated in the development and implementation of the conference. The conference attracted 41 individuals from various schools from IL, IN, MI and OH.
- Director, *The Dynamics of Climate Conference*. The three-day conference was held on May 15-17, 2013. The conference utilized speakers, breakout sessions (for modeling and guided practice), and work sessions (i.e., Planning for Action). The conference prepared formal and informal educators to use the toolkit to deliver teacher professional development. The Purdue Climate Change Research Center (PCCRC) and the Center for the Environment (C4E) collaborated in the development and implementation of the conference. The conference attracted 43 individuals from various formal and informal educational institutions and organizations. For example, the Chicago Academy of Sciences, Saint Joseph's College, University of Tennessee at Martin, SUNY Fredonia, National Weather Service, NUVO/Indiana Living Green, Penn State University, Delaware State University, Sustainable Indiana, Great Lakes Research and Education, Midwest Regional Climate Center, Captain Planet Foundation (GA), Purdue University, and Jasper County CES.
- Facilitator and instructor, Project Wild workshops (1990-Present). Over 640 participants have been involved in the six-hour workshops.
- Facilitator and instructor, Project Learning Tree workshops (1990-Present). Over 425

participants have been involved in the eight-hour workshops.  
 Facilitator and instructor, Project Wet workshops (2000-Present). Over 640 participants have been involved in the eight-hour workshops.  
 Coordinator and instructor, Hoosier Riverwatch workshops (2006-Present). Over 440 participants have been involved in the eight-hour workshops.  
 Lilly Contemporary Issues for Educators: Climate Change (2008, March 5). Shepardson, D.P., Niyogi, D., Choi, S. & Charusombat, U., Lilly Nature Center, Celery Bog Nature Area, West Lafayette, IN (a workshop for middle school educators—20 participants)  
 Co-Director (1991), School Mathematics and Science Center, Conference on Reform in Science, Mathematics, and Technology Education.  
 Co-Director and co-instructor (1992) Enhancing Elementary Science A Workshop for Teachers, K-6.  
 Co-Director and co-instructor (1992) Summer Workshop on Reforming Science Education.  
 Director Project INLAB workshops (1992-96). Project includes 6 academic year workshops and a 3-week summer institute for each of the 4 years of operation.  
 Co-Director and co-instructor (1992) Science Reform Conference (Nov. 12-14), Airport Hilton, Indianapolis. (see file for SMSC brochure describing conference)  
 Co-Director (1993-94) Systemic Reform in Science Education, involving teachers from Crawfordsville, Franklin, and Brownsburg school corporation.  
 Director (Oct. 21 & Nov. 18, 1994) Science Laboratory Instruction Workshop, Purdue University, involving science teachers from across the state of Indiana.  
 Director (Oct 13 & Nov 10, 1995) Alternative Assessment in Science Workshop, Purdue University, involving science teachers from across the state of Indiana.  
 Director (May 3-4, 1996) INLAB Turkey Run Conference, involving science teachers from across the state of Indiana.  
 Co-Director (1997). SMSC conference, Implementing Mathematics, Science, and Technology Standards into K-12 Schools, Purdue University.  
 Co-Director (1998). SMSC conference, Implementing Mathematics, Science, and Technology Assessment Standards into K-12 Schools, Purdue University.  
 Director (2021) Dynamics of Climate Workshop sponsored by EEAI (2020, postpone to April 2021 because of COVID-19).

#### 4. Conducting Studies and Investigations to Support Educational Programs

External Evaluator (1999-2000) for Project Learning Tree (PLT), Indiana Department of Natural Resources. Responsible for planning, developing, and implement the evaluation of PLT.

External Evaluator (1996-98) for the NSF funded CTEP project (PIs: Professors Krockover, Ridgeway, & Sherman). Responsible for planning, developing, and implementing the evaluation component of the CTEP project for improving undergraduate science teaching.

Conducted and submitted an evaluation report on the Florida International University NASA Summer Camp program for minority and at risk students (summer 1996).

#### 5. Translating Research Information into Practice

Directed and edited the development and production of the Integrating Laboratory Instruction and Assessment (INLAB) staff-development handbook. The handbook translates research on laboratory teaching and learning, as well as alternative assessment into a useable form by practitioners. The handbook enables teachers to apply scientific and pedagogical information to classroom practice and teacher inservice (1998).

Developed the science assessment web site, that contains example alternative assessment tasks

developed by teacher-participants in the Eisenhower funded assessment project. The web site serves as a resource for teachers and educators interested in professional development in science assessment (1998-1999). The web site is located at:  
[http://omni.cc.purdue.edu/~shepardd/science\\_assessment/welcome.htm](http://omni.cc.purdue.edu/~shepardd/science_assessment/welcome.htm)

Prepared the document titled, "Identifying characteristics of the multi-age intermediate classroom that foster successful learning for children," with Krockover, Pekarek, and Riggs (1998). The document translates classroom-based research into recommendations for practice.

Developed "A Field Guide Primer for Macroinvertebrate Monitoring of Wetland Environments" document that provides science educators and others with information about establishing and implementing a field study for monitoring and learning about wetland environments (1999). The field guide was developed as part of my study in a second discipline.

Co-developed the Children's Literacy and Science Project (CLASP) web site that summarizes the research and literature on children's self-produced science journals, linking the research to strategies for teaching children using journals and integrating science and literacy (2002).

## 8. University, College, and Departmental Service

### a. University Service

Member, Selection Committee, Kappa Delta Pi, Krockover Scholarship (2005-2020)  
 Member, Giant Leaps Toward a Sustainable Economy & Plannet planning committee, Purdue's Giant Leaps Sesquicentennial Ideas Festival (2018-19)  
 Proposal reviewer for the Center for the Environment, seed grants (2018)  
 Chair, Center for the Environment, Environmental Education Working Group (2015-2016)  
 Member, C4E Strategic Vision Development Task Force (2013-14)  
 Member, search committee for the Director of the Purdue Climate Change Research Center (2012)  
 Internal Executive Committee, Discovery Park Center, Center for the Environment (2005-09)  
 University Campus Grievance Steering Committee (2010)  
 Outreach and Education Committee, Center for the Environment (2005-06)  
 Member, search committee for the Director of the Center for the Environment (2005-06)  
 Proposal Review Panel Member, Center for the Environment (2005-06)  
 Purdue University Task Force on Recycling and Waste Management (1991-2000)

### b. College Level Service

COE Faculty Mentoring Committee (2016-2017)  
 COS Grade Appeals Committee (2014-17)  
 COE Dean's Review Committee (2014-15)  
 COE Faculty Affairs Committee (2011-14, Chair 2012-13)  
 COE ADDFD Office Affiliate (2012-13)  
 COE Grievance Committee (2011-2014)  
 COE PRF reviewer (2001, 2002, 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2017, 2018)  
 COE Faculty Grievance Committee (2008-09)  
 COE Judge, Annual Graduate Student Educational Research Symposium (2008)  
 COE Curriculum Committee (1992-95, 2007-10, Chair 2009-10)  
 COE C&I Dept Head Review Committee (2006-07)  
 COE Chair, CRESME Search Committee (2005-06)

COS Science Education CRESME and Coalesce Search Committee (2003-06)  
 COE Awards Committee (2003-06, Chair 04-05)  
 COE Grade Appeals Committee (2002-05)  
 COE Area Committee (2002; 2003-2006, 2006-2009)  
 COE Strategic Planning Task Force Committee (2002-03)  
 COE Faculty Grievance Committee (2002-03, 2012-14)  
 COE Faculty Affairs Committee (1997-2000, 2011-2013)  
 COE Technology Task Force, Infusion Group Subtask Force (1992-1995)  
 Reviewer, School of Education monograph The scientist-practitioner model and practice  
 Ad hoc Publications Committee, School of Education (1994).  
 COE Teacher Education Council (1994-1997, 2010-13, Executive Committee 2012-13)  
 COE R&D Advisory Committee (1995-96)  
 Reviewer, Sigma Xi High School Teacher Award committee (1996)

c. Departmental Service

Convener, Science Education program (2018-2020)  
 C&I Primary Committee (2002-Present)  
 Elementary Teacher Education Committee (2017-Present)  
 EAPS Outreach Committee (2003-07, 2010-2021)  
 EAPS, Judge, Graduate Student Expo (2014)  
 C&I Graduate Committee Task Force on the Oversight of Qualitative Research  
 Courses and Core Seminars in Curriculum and Instruction (2012)  
 C&I Science Education Search Committee (2011-12)  
 EAPS Performance Advisory Committee for Eric Riggs (2007-2011), Sonia LasherTrapp  
 (2012-2013), Mike Baldwin (2012-2015), Barbara Gibson (2019-Present)  
 Chair, Elementary Science Education Search Committee (2006-07)  
 EAS Graduate Committee (2006-2009)  
 Chair, Elementary Education Committee (2004-05)  
 C&I Leadership Council (2001-02; 2002-03; 2004-05)  
 Elementary Science Education Search Committee (2003-04)  
 Elementary Teacher Education, Student Enrollment Sub-Committee Convener (2002-03)  
 Chair, Elementary Science Education Search Committee (2001-02)  
 School Mathematics and Science Center (1990-1998)  
 Chair, Ad Hoc Committee on Admissions to Elementary Education (1991-93)  
 Teacher Education Certificate Council, Jr High/Middle School Education (1991-1999)  
 Chair, Teacher Education Certificate Council, Elementary Education (1991-96)  
 Faculty Affairs Committee (2001-03, Chair 2001-02; 1991-93)  
 Social Studies Education Search Committee (1991-92)  
 Reviewer, PRF David Ross Research Grant proposals (1991-93)  
 Chair, Ad hoc Committee to Establish a New Elementary Teacher Education Program,  
 Department of Curriculum and Instruction (1994-96)  
 Graduate Committee, Department of Curriculum and Instruction (1994-97; 1997-2000)  
 Chair, Subcommittee on Graduate Student Awards (1997-2000)  
 Chair, Science Education Program Area (1994-97)  
 Member Block IV Elementary Education Reform Group (1998-1999)  
 Member Environmental Science Capstone Course for Elementary Teachers, School of  
 Science Working Group (1998-1999)  
 Convener, Elementary Education Graduate Review Panel (1999-2000)

10. Other Service to the Profession

External Reviewer for university promotion and tenure, various universities, 1 in 2021; 35  
 confidential reviews to date (2002-present)

11. Community Service Activities

Member, Education Committee, Wabash River Enhancement Corporation (2010-2020)  
Environmental Education Association of Indiana's (EEAI) working group to  
develop an Environmental Literacy Plan for the state of Indiana (2017-2018)  
Board Member, Board of Directors, Hands of the Future (2014-2017)  
Friends of Celery Bog Advisory Board (2008-2016)  
Member, West Lafayette Parks and Recreation Master Plan Update workshop (2015)  
Public Schools Foundation of Tippecanoe County, Grant Committee Member (2002-2006)  
Tippecanoe County Soil Water Conservation District, Education Committee Member (2004-  
2008)  
Chamber of Commerce "Golden Apple Awards" Committee (1990-1993; Interview  
Committee Chair, 1993)

12. Consulting Activities

The National Energy Foundation, Salt Lake City, UT (1990-2005). Energy and  
environment curriculum developer and reviewer.

Project STEPS, Science Education Center, The University of Iowa, Iowa City, IA  
(1990-1996). Research and evaluation consultant.

The Upjohn Company, Science Grasp program, Kalamazoo, MI (1990-1994)

Indianapolis Children's Museum, Indianapolis, IN (1993). Provided expertise on children's  
understandings and ways of thinking about science concepts, guiding the museums  
development of exhibits.

U.S. Department of Education, Fund for the Improvement and Reform of Schools and  
Teaching (1993). Review Panel member for the Secretary of Education's discretionary  
funds for innovative programs in education.

Indiana Department of Education, Indiana Science Assessment Advisory Committee (1994-  
1996). The committee was charged with the responsibility of establishing policy  
and preparing an alternative assessment document to foster the integration of alternative  
assessment techniques into Indiana classrooms. The invitation to serve on the committee  
was a result of my direction of the INLAB project, which is on the cutting edge of  
alternative assessment within the state of Indiana.

U.S. Department of Education, Dwight D. Eisenhower National Program for Mathematics and  
Science Education (1994 & 1995). Review Panel member for priority three, innovative  
environmental education teacher development projects and discretionary funds.

Indiana Department of Education, Science Proficiency Guide Assessment Team (1998-99).  
The committee is charged with the responsibility of reviewing and selecting existing  
assessment items that may be reflective of items utilized on ISTEP+ and that align with  
the state science proficiency guide.

National Science Foundation, Division of Elementary, Secondary, and Informal Education  
(1998). National Review Panel member for the Presidential Awards for Excellence in  
Mathematics and Science Teaching. Panel responsible for reviewing and  
recommending the Presidential Award winners to the White House.



Indiana Department of Education, Science Proficiency Guide Team (1999-2001).

The committee is charged with the responsibility of revising the existing proficiency guide and implementing staff development for schools and teachers. The committee will also be developing the Project 2061 Institute for the state of Indiana.

Tippecanoe Soil & Water Conservation District (1999-2000). This committee is responsible for developing the Water Education Vehicle that will be used to deliver teacher professional development and instructional support to local school in terms of teaching about water and watersheds.

CUNY, Hunter College (2008). External reviewer, PSC-CUNY Research Award Program.

Indiana Department of Education, Science Standards Revision Committee (2008-2010).

The committee is responsible for revising the state science standards.

Indiana Department of Education, Science Standards Revision Committee (2015-16).

Reviewed and revised the secondary environmental science standards.

Indiana Department of Education and Purdue Climate Change Research Center (2020-21).

Development of IN DOE K-12 Climate Change Education framework that is linked to the IN standards. The five critical topics from our American Federation of Teachers' *Teaching Climate Change* article serves as the foundation for the framework.

### 13. Other evidence of national recognition

a. Received over 180 national and international requests for published and presented work. My publications and work are cited in the work of other professionals that publish in the major science education research journals. Based on the Social Science Citation Index, my work has been cited over 535 times by other science education researchers. Work is cited 20 times in the 2007 *Handbook of Research on Science Education* and is cited in the NRC (2012) *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas*, and in the California State Framework (2017).

#### b. Recognition of work in other published textbooks.

The SSCS problem solving instructional model that I have developed and evaluated in collaboration with Edward Pizzini, was recognized in Wakefield (1996), Educational psychology: Learning to be a problem solver, Boston, MA: Houghton Mifflin. The SSCS model is recognized in Chapter 10 (pp. 445-448), "Cognitive learning theories, part 2: Achieving the goal of higher-order thinking," as an effective instructional model for teaching problem solving and higher-order thinking.

The SSCS problem solving instructional model that I have developed and evaluated in collaboration with Edward Pizzini, is described in the elementary science methods textbook titled, "Learning to Teach Science: A Model for the 21<sup>st</sup> Century" by Ebenezer and Connor (1998). The instructional model is described in chapter 6, "Constructing and Negotiating" (pp. 140-141). The narrative describes the instructional model and references the articles by Pizzini, Shepardson, and Abell (1988) and Pizzini, Abell, and Shepardson (1988).

My collaborative work on children's self-produced journals as a tool for science teaching, learning, and assessing (Shepardson, D.P.\* & Britsch, S.J.\* 1997. Children's science journals: Tools for teaching, learning, and assessing. Science and Children, 34, 13-17 & 46-47) was identified in NSTA's publication, "Pathways to the Science Standards, Elementary School Edition" (Lowery, 1997), as a resource for implementing the NRC standards.



My article titled, "Teaching teachers: Gender bias in the classroom--A Self-Evaluation" published in *Science and Children*, was utilized by Sanders, Koch, and Urso (1997) in their book, "Gender Equity Sources and Resources for Education students," published by Lawrence Erlbaum.

My collaborative work on science assessment (see Shepardson, D.P.\* & Jackson, V. 1997. Developing alternative assessments using the Benchmarks. *Science and Children*, 35, 34-40.) is utilized in the NSTA publication titled, "Science Educator's Guide to Assessment", by Doran, Chan, and Tamir (1998).

My collaborative work on science journals and assessment (see Shepardson, D.P.\* & Britsch, S.J.\* 1997. Children's science journals: Tools for teaching, learning, and assessing. *Science and Children*, 34, 13-17 & 46-47.) is utilized in the elementary science methods book titled, "Science Stories: Teachers and Children as Science Learners", by Janice Koch (1999). Koch both refers to the article as a resource for teaching science as inquiry and bases her examples of journal assessment on the assessment framework presented in the *Science and Children* article.

My collaborative work on science assessment (see Shepardson, D.P.\* & Jackson, V. 1997. Developing alternative assessments using the Benchmarks. *Science and Children*, 35, 34-40.) is utilized in the elementary science methods book, "Essentials of Elementary Science" (2<sup>nd</sup> edition) by Dobey, Beichner, and Raimondi (1999).

My collaborative work on gender bias (see Shepardson, D.P.\* & Pizzini, E.L. 1991. Gender bias in the classroom: A self-evaluation, *Science and Children*, 29, 38-39) is incorporated into the elementary science methods book, "Discovering elementary science: Method, content, and problem-solving activities" (2<sup>nd</sup> edition) by Tolman and Hardy (1999).

My article titled, "Teaching teachers: Gender bias in the classroom--A Self-Evaluation" published in *Science and Children*, was utilized by Sanders (2000) in her book titled, "Fairness at the Source: Assessing Gender Equity in Teacher Education for Colleges and Universities," published by the Washington Research Institute, Seattle, WA.

My work on the social construction of knowledge (Shepardson, D.P., 1997. Of butterflies and beetles: First graders' ways of seeing and talking about insect life cycles. *Journal of Research in Science Teaching*, 34, 873-898.) and alternative assessment (Shepardson, D.O. & Jackson, V., 1997. Developing alternative assessments using the Benchmarks. *Science and Children*, 35, 34-40.) is used by David Martin (2000) in his elementary science methods book, "Elementary Science Methods: A Constructivist Approach" published by Wadsworth.

My collaborative work on science journals and assessment (see Shepardson, D.P.\* & Britsch, S.J.\* 1997. Children's science journals: Tools for teaching, learning, and assessing. *Science and Children*, 34, 13-17 & 46-47.) is utilized in the elementary science methods book titled, "Science and Science Teaching: Science is something You Can Do", by Sharon Sherman (2000). New York: Houghton Mifflin Co.

My work on the social construction of knowledge (Shepardson, D.P., 1997. Of butterflies and beetles: First graders' ways of seeing and talking about insect life cycles. *Journal of Research in Science Teaching*, 34, 873-898.) is utilized in "Language, Discourse, and Learning in Science: Improving Professional Practice through Action Research" that is published by the Southeast Eisenhower Regional Consortium for Mathematics and Science

Education.

My collaborative work on gender issues in science education (see Krockover & Shepardson, 1995) is incorporated in to the science education text by John Weaver, Peter Appelbaum and Marla Morris (2001) titled, “(Post) Modern Science (Education): Propositions and Alternative Paths.”

My collaborative work on science journals and assessment (see Shepardson, D.P. \* & Britsch, S.J. \* 1997. Children’s science journals: Tools for teaching, learning, and assessing. *Science and Children*, 34, 13-17 & 46-47.) is utilized in the elementary science methods book titled, "Sciencing, 4<sup>th</sup> edition", by Sandra E. Cain (2002). Upper Saddle River, NJ: Merrill Prentice Hall.

My collaborative work on science journals and assessment (see Shepardson, D.P. \* & Britsch, S.J. \* 2000, Analyzing children’s science journals, *Science and Children*, 38 (3), 29-33.) is utilized in the elementary science methods book titled, "Teaching Children Science: A Discovery Approach," by J. Abruscato (2004). New York: Pearson Publishing.

CLASP web site recognized as a resource for incorporating children’s journals into science teaching as tools for documenting learning. In Peggy Ashbrook (2010), Documenting Learning, *Science and Children*, 48(3), 24-25.