
ASTE 2008 International Conference Mini-Proceedings

Adams, April D., Northeastern State University adams001@nsuok.edu
Macklin, Monica J., Northeastern State University
Underwood, Melissa, Glenpool Public School

Analyzing Inquiry-Based Instruction with the Analysis of Inquiry Rubric

While viewing a video of inquiry-based instruction, participants will use the newly refined Analysis of Inquiry Rubric (AIR) to document teacher actions that facilitate inquiry.

Ajame, Ernestine A., Wayne State University ernieangwi@yahoo.fr
Ferreira, Maria M, Wayne State University

The Role of Science Instructional Strategies on 10th Grade Students' Attitudes Towards Science

This study examined the impact that instructional strategies used in science classrooms have on 10th grade students' attitudes towards science

Akcay, Hakan, University of Iowa hakanakcay@gmail.com
Akcay, Behiye, Gazi University
Martin, Anita, University of Iowa

Change in Preservice Teachers Beliefs about Nature of Science after Experiencing a History of Science Course

The purpose of this study was to examine the effect of history of science course on preservice science teacher's understanding of nature of science.

Akerson, Valarie L., Indiana University vakerson@indiana.edu
Donnelly, Lisa A, Kent State University

Relationships among Learner Characteristics and Preservice Elementary Teachers' Views of Nature of Science

This study explored the relationships of various learner characteristics on preservice elementary teachers views of Nature of Science providing implications for teacher education.

Alegria, Adelina V., Occidental College

alegria@oxy.edu

Integrating language development and science content for middle school English learners

In this study a science teacher, working with linguistically diverse students, was observed teaching a science unit to learn how she utilized literacy activities.

Allan, Elizabeth A., University of Central Oklahoma
Bowen, John, University of Central Oklahoma

eallan@ucok.edu

Making a Connection: Scientific Research and High School Students

This paper reports on a partnership where students participate in university level research at a local school also providing a teacher laboratory and research experience.

Annetta, Len, North Carolina State University
Holmes, Shawn, North Carolina State University
Cheng, Meng-Tzu, North Carolina State University
Sears, Matt, Hillside High School, Durham, NC
Ogren, Chad, Enloe High School, Raleigh, NC
Simmons, Patricia, University of Missouri-St. Louis

len_annetta@ncsu.edu

Engaging Teachers and Students in Science Through Video Games: Experiences From the HI FIVES Project

This paper set will describe practical experiences from researchers, teachers and students involved in an NSF funded project where video games were used for learning.

Ardasheva, Yuliya Y., University of Louisville
Brown, Sherri L., University of Louisville

yyarda01@gwise.louisville.edu

Motivation of K-12 Teachers Seeking Training in Educating English Language Learners

This qualitative study explored professional experiences, beliefs, and attitudes that motivated elementary and secondary teachers to proactively seek training in working with ESL students.

Ateh, Comfort M., University Of California Davis
Passmore, Cindy, University Of California Davis

cateh@ucdavis.edu

Defining the characteristics and underlying principles of effective elicitation of student ideas in secondary science.

The ASTE Scientist/Science Educator Collaborative Forum's charge is to provide an ongoing space for conversations among scientists and science educators engaged in various collaborative projects.

Aydeniz, Mehmet, The University of Tennessee, Knoxville

maydeniz@utk.edu

Can Technology Do the Job? Facilitating Inquiry Learning Using Dynamic Content Management Systems

We report on factors that influenced prospective science teachers' successes and failures with designing lesson plans that reflected the essential features of inquiry using WordPress.

Badara, Ioana A., University Of Tennessee

ibadara@utk.edu

Melear, Claudia T., University Of Tennessee

The Impact of a Pre-Service Research-Type Science Course on the Implementation of Inquiry-Based Instruction: A Grounded Theory.

Using a grounded theory approach, this study examines the impact of a research-based course on the preparation of pre-service science teachers to use inquiry-based instruction.

Bailey, Janelle M., University of Nevada, Las Vegas

janelle.bailey@unlv.edu

Crippen, Kent J., University of Nevada, Las Vegas

Sanguenza, Cheryl R., University of Nevada, Las Vegas

Colin, Cassandra, University of Nevada, Las Vegas

Ebert, Ellen K., Clark County School District/UNLV

Project PASS: Researching Outcomes of a Long-Term Model for Science Teacher Professional Development

Research projects from a three-year professional development model investigate teachers' beliefs in, implementation of, and possible conceptual change about reform-based science education.

Balcerzak, Phyllis, Science Outreach-Washington University in St. Louis

pbalcerz@wustl.edu

May, Victoria, Washington University - St. Louis

Leadership and the Secondary Science Teacher

This report presents an analysis of 450 secondary life science teachers' views of leadership. The results support a collaborative model of leadership.

Baldwin, Brian C., Kean University

brian@bcbaldwin.com

The “greening” of teacher preparation: Teacher candidates’ views on a hybrid methods course

Teacher candidates’ views on a hybrid methods course indicate that they are willing adapters of the change, yet desire more face-to-face class time.

Barman, Charles R., Indiana University at Indianapolis

cbarman@iupui.edu

Houser, Linda L., Indiana University at Indianapolis

Allspaw, Kathleen M., Indiana University at Indianapolis

Preparing Career Changers to Teach in an Urban Environment

The Transition to Teaching Program is a certification program designed for career changers. Features of this program and data about its effectiveness will be discussed.

Bartley, Anthony W., Lakehead University

abartley@lakeheadu.ca

Melville, Wayne, Lakehead University

Fazio, Xavier, Brock University

Experiencing Inquiry in Secondary Science Methods Course: Structure and Ambiguity in Open Inquiry Assignments

Preservice teachers experienced a range of inquiry oriented learning activities as part of their methods courses. This paper describes both the activities and their responses.

Barufaldi, James P., University of Texas

jamesb@mail.utexas.edu

Hobbs, Mary E., University of Texas

Fletcher, Carol L., University of Texas

Sherron, Todd, University of Texas

McLeland, Patty, Hutto Independent School District

An Effective Professional Development Model in Science Education

The purpose of this themed paper set is to discuss an effective professional development model for inservice science education.

Bautista, Nazan U., Miami University

uludagn@muohio.edu

No Elementary Teacher Left Behind?: Investigating Elementary Teachers’ Physical Science Conceptions after the No Child Left Behind Act

This study investigates the changes, if any, in elementary teachers' conceptions of elementary grade level physical science concepts after the No Child Left behind Act.

Beamer, Tyler, College of Charleston

vansicklem@cofc.edu

Sickle, Meta Van, College of Charleston

Harrison, Gary, College of Charleston

Tempel, George, Medical University of South Carolina

Lasting Impact of a Professional Development Program on Constructivist Science Teaching Methods

This research was examined the GK-12: Lowcountry Partners for Inquiry program. Scores in the CLES categories were significantly ($p < .05$) higher two years post-program.

Bergman, Daniel J., Wichita State University

daniel.bergman@wichita.edu

The effects of two secondary science teacher education program structures on teachers' habits of mind and action

This presentation describes results of an ongoing study comparing science teachers prepared through either one or multiple (3-4) semesters of preservice science methods coursework.

Beyer, Carrie J., University of Michigan

cjbeyer@umich.edu

Davis, Elizabeth, University of Michigan

Supporting Preservice Elementary Teachers' Critique and Adaptation of Science Curriculum Materials Using Educative Curriculum Materials

This study examines how preservice elementary teachers critique and adapt inquiry-oriented science curriculum materials with and without support.

Binns, Ian C., University of Virginia

ianbinns@virginia.edu

Schnittka, Christine G., University of Virginia

Bell, Randy L., University of Virginia

PowerPoint: Encouraging high-tech chalk & talk or reforms-based science instruction?

This descriptive study explored secondary preservice science teachers' use of presentation software (i.e., PowerPoint) to support science teaching and learning.

Black, Alice (Jill) A., Missouri State University

ablack@missouristate.edu

participation.

Bowen, Michael G., Mount Saint Vincent University
Bartley, Anthony W, Lakehead University

gmbowen@yahoo.com

The nature of feedback on student laboratory reports: Issues in the formative assessment practices of preservice science teachers

Preservice teachers participating in formative assessment activities “reviewing” student inquiry reports found difficulties providing appropriate feedback. Implications are discussed with proposals for teacher education.

Bowman, Jacqueline K., Arkansas Tech University
Kondrick, Linda C, Arkansas Tech University

jbowman@atu.edu

The Relationship between Student Attitudes and Use of Concept Mapping in Science Courses

Although concept mapping is proven to be an effective study tool, the researchers found reasons that students may not choose to use this tool independently.

Bradbury, Leslie U., Appalachian State University
Goodman, Jeff M., Appalachian State University

upsonlk@appstate.edu

Using Wikispaces in an Elementary Science Methods Course: Learning from the Experience and Planning for Future Directions

Presenters will share experiences incorporating wikispace building in an elementary science methods course to reinforce science content through technology and writing to learn science.

Brandoni, Chiara R., Teachers College, Columbia University

crb2121@columbia.edu

Improving divergent thinking ability in science: Reflections on research using a new model of divergent thinking to create divergent thinking activities and assessments.

Based on the results of previous research using a new model, teacher rubrics and sample activities have been created to improve divergent thinking in science.

Brown Sherri L., University of Louisville
Votaw, Nikki L., University of Louisville

s.brown@louisville.edu

A longitudinal study of science based professional development for elementary teachers

This study examines the science professional development grade 4-6 teachers received over three years and its impact on their practices and student learning.

Campbell, Ashley J., West Texas A&M University

acampbell@wtamu.edu

Science as a Human Endeavor: The Effect of Highlighting the Lives and Work of Great Scientists in a Pre-Service Science Methods Class

This research examines the effects of integrating the lives and work of historical scientists in a science methods class.

Campbell, Todd, Utah State University

toddc@ext.usu.edu

Triad experiences: The impact of joint professional development for pre- and in- service science teachers on triad dynamics.

This presentation focuses on the results of in-depth phenomenological interviewing of triads involved in a pilot professional development project.

Cantrell, Pamela, Brigham Young University
Smith, Leigh K., Brigham Young University

pamela_cantrell@byu.edu

Learning and Implementing Full Science Inquiry: Translating Knowledge and Skills into Practice

The SciencePlus professional development program engaged teachers in an inquiry immersion experience followed by carefully scaffolded follow-up sessions that translated to successful classroom practice.

Capobianco, Brenda M., Purdue University
Eichinger, David, Purdue University
Staver, John, Purdue University

bcapo@purdue.edu

Examining pre-service elementary school science teachers' understanding of scientific inquiry

This study examines how science content courses influence preservice teachers' understandings of inquiry, their abilities to do inquiry, and design inquiry-based science lessons.

Capobianco, Brenda M., Purdue University
Eichinger, David, Purdue University
Staver, John, Purdue University

bcapo@purdue.edu

What can we learn from assessing preservice elementary science teachers' conceptions of and abilities to conduct scientific inquiry?

This study examines the effectiveness of assessing preservice elementary science teachers' understandings of and abilities to conduct inquiry and inquiry-based lessons using three assessment tools.

Capobianco, Brenda M., Purdue University
Shane, Joseph W., Shippensburg University

bcapo@purdue.edu

Brokering policies and standards through secondary preservice science teacher action research

This position paper argues that action research can serve as a powerful mechanism for understanding and enacting national policies and standards among preservice science teachers.

Powell, Janet Carlsen, BSCS
Gess-Newsome, Julie, Northern Arizona University
Taylor, Joseph, BSCS
Gardner, April L., BSCS

JPowell@bscs.org

The Impact of Professional Development and Educative Curriculum Materials on Teacher Knowledge, Teacher Practice, and Student Achievement.

Does professional development make a difference? How about educative curriculum materials? Come find out how the separate and combined impacts influence teacher and student scores.

Carnes, G. Nathan, University of South Carolina

ncarnes@gwm.sc.edu

A Conversation About Middle Level Science Teacher Preparation Texts

A round table discussion about the current status of science education texts used to prepare middle school science teachers and opportunities for change.

Carrier, Sarah J., North Carolina State University
Guarino, A. J., Auburn University

sarah_carrier@ncsu.edu

Schoolyard science meeting the needs of boys and girls.

This study assessed the efficacy of Schoolyard lessons, with boys demonstrating statistically significantly greater score gains in the treatment group than in the traditional curriculum

Cartier, Jennifer L., University of Pittsburgh
Sink, Wendy M., University of Pittsburgh
Kochhar, Jeanetta L., University of Pittsburgh

jcartier@pitt.edu

Supporting Pre-Service Elementary Teacher Learning Through Use of an Instructional Planning Framework

Here we will describe the instructional planning framework that anchors our Elementary Science Methods course and how this framework emphasizes important aspects of scientific practice.

Cavallo, Ann M.L., University of Texas at Arlington
Fox, Jill, University of Texas at Arlington
Lee, Joohee, University of Texas at Arlington

cavallo@uta.edu

Revealing the Mystery (Boxes): Exploring Elementary School Students' Views and Understandings of Science

This research explores fourth graders' understandings and views of NOS as they experience science (Mystery Boxes) as dynamic and tentative, socially constructed, and global.

Ceglie, Robert J., University of Connecticut
Settlage, John J., University of Connecticut

rceglie@hotmail.com

The Evolving Professional Identity of a College Biology Instructor

Using Gee's identity theory, we investigated how a college biology professor's experiences led to the evolution of a sense of self.

Cheng, Meng-Tzu, North Carolina State University
Annetta, Leonard A., North Carolina State University
Holmes, Shawn Y., North Carolina State University

mtcheng@ntu.edu.tw

Students learning science through modifying video games made by their teachers

The proposal displays the current results of HI FIVES. An original game, a modified game, and a video will be visually presented.

Richardson, Rita M. Coombs, University of St. Thomas rcoombsrichardson@yahoo.com

A University Public School Alliance to Increase the Number of Science TeachersA University Public School Alliance to Increase the Number of Science TeachersA University Public School Alliance to Increase the Number of Science Teachers

The presentation includes descriptions of successful partnerships between a university and two school district and a program of science education where teachers develop their philosophy.

Cox-Petersen, Amy, Cal State Fullerton
Ponder, Jennifer, Cal State Fullerton

acox@fullerton.edu

Service-Learning, Civic Involvement, and Stewardship: Taking Action in Science Education

Discussion, models, and research to encourage the integration of action-based pedagogical strategies in science education.

Crofford, Geary D., University of Oklahoma/College of Education

gcrofford@ou.edu

Pedersen, Jon, University of Oklahoma/College of Education

Gram, Wendy K., University of Oklahoma/Sam Noble Oklahoma Museum of Natural History

Effectiveness of a summer professional development experience with authentic scientific research and inquiry-based teaching components in Improving Middle-level Science Teachers' Self-Efficacy and Understanding of the Nature of Science

Teachers participating in a scientific research experience coupled with inquiry-based teaching approaches increased their scientific literacy and likelihood to implement inquiry-based curricula

Crowther, David T., University of Nevada Reno

crowther@unr.edu

Guided Inquiry in General Biology for Education Majors: Longitudinal Study

Method of instruction for introductory biology for K-8 majors utilizing guided inquiry had a significant difference in content learned as compared to traditional lecture courses.

Cullin, Michael J., Lock Haven University of Pennsylvania

mcullin@lhup.edu

Haefner, Leigh A., the Pennsylvania State University - Altoona

Courson, Susan, Clarion University of Pennsylvania

Friedrichsen, Patricia J., University of Missouri - Columbia

Brown, Patrick, University of Missouri - Columbia

Hanuscin, Deborah L., University of Missouri - Columbia

Strategies for Supporting Prospective Teachers' Instructional Planning

Elementary and secondary teacher educators will share their experiences using various tools to support prospective science teachers in their initial instructional planning.

Dalton, Michael L., Oregon State University
Bottoms, SueAnn I., Oregon State University

michael.dalton@oregonstate.edu

From Shortage to Abundance in STEM Teacher Preparation: An Undergraduate Model

New, concurrent approaches to teacher preparation that make it possible for more undergraduate STEM students to become qualified STEM teachers while pursuing their primary degrees

Daly, Shanna, Purdue University
Bryan, Lynn A, Purdue University
Giordano, Nicholas, Purdue University

sdaly@purdue.edu

Teaching and Learning about Self-Assembly in High School Science

In this experiential session, we will engage participants in an abbreviated version of a self-assembly lesson that we developed for high school science.

Danielowich, Robert M., Northeastern Illinois University danielowich@hotmail.com

Learning through Reflection about Socioscientific Issues (SSI) Instruction: The Experiences of Four Inservice Secondary Science Teachers

Practicing teachers reflect about SSI lessons they enact in their own classrooms as opportunities for critique and change of their usual approaches to teaching science.

Daughtrey, Taz, College of Integrated Science and Technology, James Madison University
daughtt@jmu.edu

Experiencing A Sense of Time

An introductory science processes course for preservice teachers has been organized around techniques for establishing dates for a wide range of phenomena throughout geological time.

overcome the obstacles often found in preparing preservice elementary teachers to teach science.

Dias, Michael, Kennesaw State University
Eick, Charles, Auburn University

mdias@kennesaw.edu

Practicing what we teach: Interpreting a teacher educator's experiences with 8th grade physical science students

Case study details practical knowledge developed while implementing a guided inquiry/conceptual change curriculum and offers implications for preservice and inservice professional development of science teachers.

DiBiase, Warren J., UNC Charlotte
Steck, Todd R., UNC Charlotte
Hilger, Helene, UNC Charlotte
Wang, Chuang, UNC Charlotte

wjdibias@uncc.edu

Multi-Campus Design and Implementation of Open-Ended PBL Courses in Environmental Biotechnology with Interdisciplinary Learning

This session will provide an overview of a three-year study involving the design and implementation of an interdisciplinary course in environmental biotechnology .

Dickerson, Daniel L., Old Dominion University
Stewart, Craig O., Old Dominion University
Cutshaw, Daniel V., Old Dominion University

ddickers@odu.edu

Rhetorical Analysis of Socioscientific Issues in Popular News Media

This study investigates the rhetorical outcomes of different frames for presenting science to non-specialists in media (informal educational contexts).

Donna, Joel D., University of Minnesota
Roehrig, Gillian H., University of Minnesota
Struss, Herbert, University of Minnesota
McDonald, Eric, University of Minnesota
Bang, Eun, Arizona State University
Luft, Julie, Arizona State University

donna010@umn.edu

Online Induction: Working to meet the needs of beginning science teachers

This session explains how theory and data influenced the iterative design of an online induction program designed to support in-service science teachers.

Donnelly, Lisa A., Kent State University
Sadler, Troy D., University of Florida

ldonnell@kent.edu

Indiana High School Science Teachers' Views of Standards and Accountability: "Is It Better to Feed the Hogs or to Weigh 'Em?"

This study investigates how secondary science teachers regard state science standards, modify curricula according to standards, and characterize impacts of standards on students and teachers.

Eick, Charles J., Auburn University
Dias, Michael, Kennesaw State University

eickcha@auburn.edu

Evaluation of the Interactions in Physical Science? guided inquiry curriculum

A science teacher educator teaches and evaluates the effectiveness of a new reform-based curriculum, Interactions in Physical Science?, on eighth-graders' engagement and conceptual learning.

Ellis, James D., The University of Kansas
Bulgren, Janis, University of Kansas

jdellis@ku.edu

A design study to develop strategies for teaching scientific argumentation skills

We will share work on a design study, supported by NSF, to produce teacher education materials for middle school science to enhance student scientific argumentation.

Everett, Susan A., University of Michigan-Dearborn
Luera, Gail R., University of Michigan-Dearborn
Otto, Charlotte A, University of Michigan-Dearborn

everetts@umd.umich.edu

Using a functional model to develop a mathematical formula

A functional model of a teeter-totter is used to help pre-service elementary teachers develop the mathematical relationship of a Class 1 lever.

Everett, Susan A., University of Michigan-Dearborn
Moyer, Richard H., University of Michigan-Dearborn

everetts@umd.umich.edu

Pre-Service Elementary Teachers' 5E Learning Cycle Science Lesson Plans

An analysis of 5E learning cycle lesson plans revealed that pre-service elementary teachers were least successful in developing an appropriate question for students to investigate.

Farland, Donna L., The Ohio State University

farland.3@osu.edu

Middle School Girls' Speak out about Scientists II: Longitudinal Study from a Summer Camp Experience

This study examined how middle school girls' perceptions of scientists were modified as a result of consecutive years participation with a university science summer camp.

Farland, Donna L., The Ohio State University

farland.3@osu.edu

A Cross-National Descriptive Study: Comparing The Who, What and Where of Scientists between Two Cultures

The purpose of this study was to identify and analyze students' perceptions of scientists (N=450) and compare how the two different educational systems view scientists.

Fazio, Xavier, Brock University

xavier.fazio@brocku.ca

Karrow, Doug, Brock University

Implementation of "NatureWatch" Ecological Monitoring Program within a Local Elementary School

This paper reports upon the implementation processes and outcomes of Environment Canada's "NatureWatch" ecological monitoring program within a local elementary school.

Fazio, Xavier, Brock University

xavier.fazio@brocku.ca

Pre-service science teachers' challenges during their practicum: supporting innovative practices

This research study explores secondary pre-service science teachers' challenges identified during their practicum experience and the role of the practicum in supporting innovative practices.

Feldman, Allan, University of Massachusetts Amherst

afeldman@educ.umass.edu

Beatty, Ian D., University of Massachusetts Amherst

Leonard, William J., University of Massachusetts Amherst

Gerace, William J., University of Massachusetts Amherst

Technology-Enhanced Formative Assessment: An Innovative Approach to Student-Centered Science Teaching

We integrate question-driven instruction, formative assessment, dialogical discourse, and classroom response technology into a unified pedagogical method, with an intensive, sustained professional development program.

Fetters, Marcia K., Western Michigan University marcia.fetters@wmich.edu
Isola, Drew, Allegam Public Schools
Lantz, Tammy, Traverse City Public Schools

Infusing Inquiry into Science Methods Courses

Strategies for the inclusion of inquiry activities in methods courses supporting pre-service teachers in developing inquiry activities for their students.

Fetters, Marcia K., Western Michigan University marcia.fetters@wmich.edu
Hickman, Paul, PhysTEC

PhysTEC: Building a Coalition to Support Physics Teacher Preparation

This presentation highlights the work of a national coalition of colleges and universities designed to improve the quality and quantity of physics and physical science teachers.

Fidler, Chuck G., Syracuse University cgfidler@syr.edu
Dotger, Sharon, Syracuse University

Pre-Service Elementary Teachers Conceptions of Scale

Evaluate misconceptions among pre-service elementary teachers to inform the development of undergraduate curricula that model themes of scale and prepare future elementary teachers teaching science.

Finson, Kevin D., Bradley University finson@bradley.edu

Case Study Course Project Between Secondary Science Methods and Special Education Methods

Described will be a planned collaborative effort between secondary science methods and special education methods courses to improve pre-service teachers' instruction

Fleming, Michelle A., University of Minnesota

bake0101@umn.edu

Preservice Elementary Teachers' Intersecting Views of the Natures of Science and Art and Teaching Science and Art

This study examines preservice elementary teachers' perceptions of science, art, and elementary teaching, as well as views of connecting or integrating disciplines.

Fletcher, Steven S., St. Edward's University

stevenf@stedwards.edu

Roehrig, Gillian, University of Minnesota

Tobin, Kenneth, City University of New York

Bell, Randy, University of Virginia

Beeth, Michael, University of Wisconsin at Oshkosh

Lost in the crevasse : Perspectives on the relationship between theory and practice in science education.

This presentation will explore the relationship between theory and practice in science education from four perspectives: Induction; urban schools; NOS; and the conceptual change model.

Flick, Lawrence B., Oregon State University

FlickL@science.oregonstate.edu

Teaching cognitive strategies to students: A missing element in policy and practice

Participants will contrast current, reform-based conceptions of instruction with a proposed framework for explicitly teaching students about the nature of strategic thinking in science.

Forbes , Cory T., University of Michigan

ctforbes@umich.edu

Davis, Elizabeth A., University of Michigan

Preservice elementary teachers' curricular role identity for science teaching: A multi-year study

In this study we examine two years of results from a survey designed to illuminate preservice elementary teachers' curricular role identity for science teaching.

Fortney, Brian S., The University of Texas at Austin

bfortney@mail.utexas.edu

Barufaldi, James P., The University of Texas at Austin

Evaluating Change in Pre-service Teacher Beliefs through Differential Cognitive Maps

This paper discusses differential cognitive mapping used to develop the underlying structure of pre-service teacher beliefs, with interpretations informed by Epistemological, Ontological, and Social/Affective lenses.

Foster, Patrick N., Central Connecticut State University fosterp@ccsu.edu
Sianez, David M., Central Connecticut State University
Dischino, Michele, Central Connecticut State University

Integrating Engineering Concepts in Science Education

Preservice teachers develop and use engineering-design activities to introduce scientific concepts to K-12 students. Elementary-, middle-, and high-school examples will include biological and physical-science content.

Foster, Rachel, Knowles Science Teaching Foundation r.foster@kstf.org
Henson, Kevin, Lenape High School

One day at a time: An early-career teacher's evolving beliefs about using inquiry to teach chemistry.

As an early-career teacher, Kevin's beliefs about inquiry are evolving through interplay between professional development and opportunities to put his beliefs into practice.

Freed, Andrea B., University of Maine at Farmington andrea.freed@maine.edu

Environmental Service Learning: Clean Air Zone Campaign

The No Idling Project focused on reducing vehicle idling at schools. Preservice teachers worked with the Maine Department of Environmental Protection to educate local students.

Freed, Andrea B., University of Maine at Farmington andrea.freed@maine.edu
Acheson, Julianna, University of Maine at Farmington
Berger, Rebecca, University of Maine at Farmington

Teacher Reflections on NCLB

Teachers from the state of Maine were interviewed about the effect of NCLB on teaching practice, especially on the teaching of science and social science.

Freitag, Patricia K., COSMOS Corporation
Long, Laura, COSMOS Corporation

patfreitag@comcast.net

A Logic Model and Review of Metrics and Measures for the NSF - Research on Gender in Science and Engineering

Principal investigator interviews provide qualitative input for the further development of the NSF-GSE program logic model. Measures of broader impact for the program are identified.

Friedrichsen, Pat, University of Missouri – Columbia
Abell, Sandra, University of Missouri - Columbia
Brown, Patrick, University of Missouri - Columbia
Lankford, Deanna, University of Missouri - Columbia
Pareja, Enrique, University of Missouri - Columbia
Volkman, Mark, University of Missouri - Columbia

FriedrichsenP@missouri.edu

PCK Data Collection Tools: Using a Lesson Planning Task to Elicit Pre-Service Teachers' Prior Knowledge for Teaching

We will share a lesson planning task and interview protocol for collecting data on teachers' prior knowledge for teaching, as well as examine data samples.

Galganski, Martha H., Washington University in St. Louis
Turner, Tommie Y., Washington University in St. Louis
Hogrebe, Mark, Washington University in St. Louis

mhgalg@yahoo.com

A teacher observation protocol examining teachers' practice and student learning in science inquiry through Lesson Study.

Scientists and educators collaborated in the construction of an observation protocol, used with Lesson Study teams, that examined teacher-student engagement in science inquiry.

Gatling, Anne L., Boston College

pfitzner@bc.edu

Connecting Teacher Preparation More Closely to Practice and Diverse Learners

Conversations generated by an elementary science teacher preparation literature review could highlight strengths and inspire new approaches connecting preparation more to practice and diverse learners.

Gay, Andrea, Chicago State University
McNew, Jill C, Washington University in St. Louis

agay@csu.edu

Elmesky, Rowhea, Washington University in St. Louis

Conflicting Ideologies in Science Education: Cooperation Across Cognitive and Sociocultural Discourses in the Development of Reform Initiatives

This self-ethnographic study examines conflicts that arose in the development of a learning progression in cellular biology, the process of their resolution, and possible implications.

Gilbert, Andrew, Kent State University

agilber1@kent.edu

Using teacher candidates' philosophy statements to facilitate the development of inquiry-based science practice.

This study represents my efforts to utilize pre-service teachers' philosophy statements to facilitate connecting their beliefs on science teaching with inquiry-based constructivist classroom practice.

Gilmer, Penny J., Florida State University

gilmer@chem.fsu.edu

Balinsky, Martin, Florida State University

Chitwood, Susan A., Florida State University

Science Graduate Students? Ideas on the Nature Of Science and Their Progression and Graduation from Graduate School

We compare science graduate students' early and later ideas on nature of science and their progression and graduation while in graduate school.

Giscombe, Claudette L., University of Massachusetts Amherst

cgiscombe@aol.com

Pathways To Success In Science: A Phenomenological Study, Examining The Life Experiences Of African-American Women In Higher Education

The life experiences of African American women faculty were explored to gain an understanding of how they negotiated pathways to successful science careers.

Glen, Nicole J., Syracuse University

nszwejbk@syr.edu

Dotger, Sharon, Syracuse University

The Use of Scientific Language in Three Elementary Classrooms: Teachers' Expectations and Beliefs about Science Vocabulary

This qualitative study examined three elementary teachers' rationale for, and expectations of, their students' science vocabulary use during classroom lessons.

Goubeaud, Karleen R., Clemson University

krge@clemson.edu

How do High School Science Teachers Adapt Their Instructional Strategies for English Language Learners?

This multiple-case study examined the instructional practices of a novice and veteran high school science teacher in their first experience teaching English Language Learners.

Govett, Aimee L., East Tennessee State University

govett@etsu.edu

Teaching Force and Motion to Elementary Teacher Candidates

How do we effectively teach elementary teacher candidates difficult physical science concepts in a non-threatening environment, combining pedagogy with science content and addressing misconceptions.

Grove, Crissie M., Florida State University

crissiegrove@yahoo.com

Dixon, Patricia J., Florida State University

Research Experiences for Teachers: Sustained Influences to Practice, Career, and Retention

This study investigated changes to previous participants of a professional development program such as changes to classroom practices and teacher retention due to program participation.

Guzey, Siddika Selcen, , University Of Minnesota

kendi003@umn.edu

Roehrig, Gillian H., University Of Minnesota

Luft, Julie A., Arizona State University

The influences on inquiry-based teaching: Pedagogical content knowledge, teaching beliefs, and teaching experience

This study examines the influence of pedagogical content knowledge, teaching beliefs, and teaching experience on the inquiry-based practices of eight secondary science teachers.

Hagedorn, Eric A., University of Texas at El Paso

ehagedorn@utep.edu

Hunt, Bill, Big Pine High School

Suskavcevic, Milijana, University of Texas at El Paso

Manciu, Felicia, University of Texas at El Paso
Manciu, Mickey, University of Texas at El Paso
Kapoor, Vishal, University of Texas at El Paso

Teaching Nanoscience to High School and Middle School Teachers: Two Year Evaluation of an Innovative Professional Development Program

The formative and summative mixed method evaluation of an innovative program to introduce high school and middle school teachers to nanoscience & technology is presented.

Hagevik, Rita A., University of Tennessee
Roberson, James, University of Tennessee

rhagevik@utk.edu

Preservice elementary science teachers' understanding of the Nature of Science through use of inscriptions in science notebooks

This study determined if through the use of inscriptions in science notebooks elementary preservice teachers could better understand the Nature of Science.

Hand, Brian, University of Iowa
Martin, Anita M., University of Iowa
Choi, Aeran, University of Iowa

brian-hand@uiowa.edu

Critical Elements in Implementing Argument in the Science Classroom

This paper set discusses 3 studies related to the pedagogical shift necessary for the implementation of scientific argument in the classroom.

Hanson, Deborah L., Hanover College
Rubino, Darrin, Hanover College
Worchester, Pete, Hanover College
Bohman, Danette, Southwestern Elementary
Datillo, Shannon, Southwestern Elementary
Pflaumer, Jodi, Southwestern Elementary
Traylor, Cindy, Southwestern Elementary

hanson@hanover.edu

Teachers Helping Teachers: A professional development model

This presentation details a collaborative professional development program developed and implemented by a group of elementary teachers for other elementary teachers.

Hanuscin, Deborah L., University of Missouri-Columbia hanuscind@missouri.edu
Nehm, Ross, City University of New York

Working in Two Worlds: Perspectives on Joint Appointment in Science & Education

Through an interactive panel discussion we will discuss the nature of joint appointments, interdisciplinary work, and faculty roles in science teacher education.

Harkins, Heather K., University of Connecticut/CT Science Center hharkins@gmail.com

Bringing the mindset and practice of professional development to preservice teacher education

Professional development experiences were incorporated into a elementary science methods course in an attempt to develop a continuum of professional development anchored in preservice education.

Harris, Tina A., Indiana University tiaharri@indiana.edu

Science Teacher Professionals: How do Science Teachers View Themselves?

Science teachers were interviewed concerning community perceptions of themselves and how current reforms influence those perceptions and their ability to teach inquiry science.

Hechter, Richard, University of North Dakota richard.hechter@und.edu
Guy, Mark, University of North Dakota

Promoting creative thinking and communication of science concepts among elementary teacher candidates

This study explored the potential benefit of video editing as a tool to support creative thinking and communication of science concepts among elementary teacher candidates.

Heddle, Mandy L., Bowling Green State University mlheddl@bgnet.bgsu.edu
Burgoon, Jake, University of Toledo
Shafer, Michelle, Bowling Green State University
Haney, Jodi J., Bowling Green State University
Ballone-Duran, Lena, Bowling Green State University
Duran, Emilio, Bowling Green State University

Elementary Teacher Misconceptions in Physical and Earth Sciences

Teacher's misconceptions in earth and physical science were explored. Teachers exhibited misconceptions similar to their students and, in some cases, revealed previously unrecognized misconceptions.

Hemler, Deb, Fairmont State University dhemler@fairmontstate.edu
Repine, Tom, West Virginia Geological and Economic Survey
McKeen, Angela, Fairmont State University

Did We Really Go To the Moon? Teaching Skepticism and Scientific Habits of Mind.

Activity conducted with elementary preservice teachers using a discrepant event to alter science perceptions while conveying lessons about scientific habits of mind will be discussed.

Henrie, Andrea W., The University of Tennessee awentwor@utk.edu
Melear, Claudia T., The University of Tennessee

Let's Start at the Very Beginning: How Preservice Teachers Plan for Instruction and What Processes Influence Them as They Engage in Lesson Planning

This research pursued a line of inquiry in order to empirically describe the prominent features of the lesson planning processes of preservice secondary science teachers.

Hermann, Ronald S., Harford Community College/Harford County Public Schools
ronald.hermann@hcps.org

Utilizing Worldview Theory to Determine the Factors Influencing an Understanding of Evolutionary Concepts

Exploratory research was conducted to determine the scientific and religious factors that influence the development of worldview perspectives and their role in understanding of evolution.

Hick, Sarah R., Hamline University hick0192@umn.edu
Roehrig, Gillian, University of Minnesota
Roehrig, Julie, Arizona State University

Portrait of a New Reformer: A Case study of a new science teacher with reform-based teaching practices.

2 year case study examines the life experiences, beliefs, and induction support that guide the practice of an exemplary reform-based new middle school science teacher.

Hintz, Rachel S., The Ohio State University

hintz.11@osu.edu

This study investigates geology knowledge acquisition by Boy Scouts through use of the Boy Scout Geology Merit Book.

This pilot study investigates geology knowledge acquisition by Boy Scouts through use of the Boy Scout Geology Merit Book.

Koomen, Michele Hollingsworth, Gustavus Adolphus College

mkoomen@gac.edu

Science for all and inclusion: Learning for Dion

Classroom constructs, challenges of learning and intent of science for all are pertinent findings of this study of one exceptional student in a life-science classroom

Horvath, Larry, San Francisco State University

lchorvath@ucdavis.edu

Passmore, Cindy, University of California, Davis

Tangled Up in Inquiry: Prospective science teacher's changing perspectives on inquiry during student teaching

Perspectives on inquiry were identified for 13 prospective science teachers. Changes in perspectives were documented in the context of planning and teaching inquiry based lessons.

Hsu, Ting-Fang, Indiana University Bloomington

thsu@indiana.edu

School-based Nutrition Education in K-12: A Survey of Teacher Perspectives

The aim of this study is to examine the present situation of K-12 nutrition education in Indiana from teachers' perspectives through a quantitative survey.

Humphrey, Robert J., Cornell University

rjh48@cornell.edu

Giving agency to natural selection in biology textbooks - a possible stumbling block in student understanding of evolution.

Biology textbooks were examined to determine how they presented natural selection and evolution. The results indicate that natural selection is often presented as an agent.

Inan, Hatice Z., The Ohio State University
Trundle, Kathy C., The Ohio State University
Kantor, Rebecca, The Ohio State University

haticezeynep@hotmail.com

Quality Environment and Quality Science Education in a Reggio Emilia-inspired Preschool

This ethnographic study examines and explores the physical environment in relevant to natural sciences in a Reggio Emilia-inspired preschool classroom.

Irving, Karen E., Ohio State University
Sanalan, Vehbi A., Ohio State University

irving.8@osu.edu

Technology-Facilitated Formative Assessment in Physical Science Connected Classrooms: Case Studies

Case studies describe physical science teachers' implementation of technology-facilitated formative assessment practice in connected classrooms in the first year of a national multi-year study.

Isabelle, Aaron D., The State University of New York at New Paltz

isabella@newpaltz.edu

Pre-service Teachers' Experiential Conceptualization of Inquiry

The majority of pre-service teachers in our science methods courses reported no familiarity with inquiry; utilizing an experiential approach we enhanced their conceptualization of inquiry.

Jablon, Paul C., Lesley University

pjablon@lesley.edu

Designing College Science Laboratory Facilities for Inquiry Teaching: Process, Form and Function

A three-year collaborative process between science and science education faculty and university administration that resulted in undergraduate science laboratories designed specifically for inquiry science teaching.

Jeanpierre, Bobby J., University of Central Florida
McDonald, Frank, University of Central Florida

bjeanpie@mail.ucf.edu

Middle School Science Teaching in Urban Low SES Schools

The purpose of the case studies was to document the journey of eight novice career change science inductees in urban low SES schools.

Johnson-Whitt, Eugenia S., University of Akron

ej9@uakron.edu

Urban students view of Science through a Botanicool Lens

The purpose of this paper is to investigate the impact of students' interest and understanding of science through Botany using an "adopt a school model".

Johnston, Carol C., Mount St Mary's College

cjohnston@msmc.la.edu

Grier, Jeanne M., California State University Channel Islands

Personal narratives and professional identities of second career STEM teachers: Perspectives on retention

This case study presents the perspectives of two STEM career changers on the development of their teacher identities and future plans in the profession.

Jones, Bill, Cedarville University

jonesw@cedarville.edu

The logic model as a framework to evaluate preservice science teacher education programs and nature of science outcomes.

Examines the use of the Logic Model as an integrative framework to evaluate science teacher education programs regarding preservice science teachers' understandings of the NOS.

Kang, Hosun, Michigan State University

kanghosu@msu.edu

Anderson, Charles W., Michigan State University

Tuckey, Steven F., Michigan State University

Merritt, Kelly, Michigan State University

Conley, Mark, Michigan State University

Science teacher candidates?? interpretations of problems of practice and scientific literacy

Science teacher candidates interpretations of video cases reveal their understandings of the role of teachers, students, the nature of scientific literacy, and science texts.

Keen-Rocha, Linda S., University of South Florida

chem1130@yahoo.com

Zeidler, Dana, USF

Personal Epistemological Beliefs in College Chemistry Laboratory Course

Epistemological beliefs improved in 4 of the 5 dimensions. The participants?? ranked laboratory work, post-lab, followed by pre-lab as the most essential to lab instruction.

Kelly, Mary Kay, University of Dayton

kellymaz@notes.udayton.edu

Developing Classroom Experiences for Middle Level Pre-service Science Teachers: Building a Community of Practice

Pre-service and in-service science teachers and university science teacher educators develop a community of practice to support science teaching and learning and teacher preparation.

Kim, Sun Young, The Ohio State University

kim.1962@osu.edu

Irving, Karen E., The Ohio State University

Teaching Genetics in Secondary Biology with Historical Materials: Nature of Science Learning

Teaching high school genetics with primary and secondary historical materials leads to student achievement in biology and increased knowledge of nature of science.

Kim, Youngmin, Pusan National University

Lim, Gilsun, University of Iowa

Yager, Robert E., University of Iowa

Korean Pre-service Science Teachers' Attitudes about Students Learning, Teaching Science, Classroom Environment, and Science Curriculum

The purpose of the study is to investigate the Korean pre-service science teachers' attitudes about science teaching and learning using questionnaire. The subjects were 58.

King, Kenneth P., Roosevelt University

kking@roosevelt.edu

Examining staff development practices in science within the context of the National Science Education Standards

During a one-year return to secondary science teaching, a science educator examines local staff development practices and their congruence with the National Science Education Standards

Kirch, Susan A., New York University

susan.kirch@nyu.edu

Siry, Christina, Manhattanville College and The Graduate Center of the City University of New York

“Maybe the algae was from the filter”: Theorizing ‘maybe’ and its use by young children in conversation

Early childhood and elementary school children coproduced sophisticated science process skills and utilized ‘maybe’ in conversations as a gateway term to possibility and potentiality.

Kirchhoff, Allison L., University of Minnesota

reese098@umn.edu

Sande, Mary E., University of Minnesota

Nam, Younkyeong, University of Minnesota

Roehrig, Gillian, University of Minnesota

Luft, Julie, Arizona State University

Nature of Science, Pedagogical Content Knowledge, and Beliefs: Influences on classroom teaching for beginning teachers

The relationship between reform-based teaching practices and pedagogical content knowledge, teaching beliefs and nature of science views was investigated in beginning science teachers.

Klein, Beth Shiner, SUNY Cortland

KleinE@cortland.edu

Weaver, Starlin D., Salisbury University

Using Podcasting to Combat Nature-Deficit Disorder

This presentation will illustrate how preservice teachers developed podcasts to encourage elementary and middle school students and teachers to go outside and do inquiry science.

Ko, Eunkyung, Illinois Institute of Technology

koeunky@iit.edu

Lederman, Norman, Illinois Institute of Technology

Is there a gap between students’ abilities to do inquiry and understandings about inquiry?

The purpose of this research is to assess the assumption that students’ understandings about inquiry reflect their abilities to do inquiry.

Koballa, Thomas R., University of Georgia

tkoballa@uga.edu

Mentoring in Support of Science Teaching

Analysis of the literature on school-based mentoring revealed understandings that have the potential to inform the practice and study of science teacher mentoring.

Koehler, Catherine M., University of Cincinnati
Veronese, Peter, SUNY-Brockport

sissianne@aol.com

Don't Leave Us Behind: Addressing the Needs of a Global Climate Change (GCC) Curriculum

This experimental session will address ASTE members who are interested in developing a global climate change curriculum. It will be a hands-on workshop.

Koehler, Catherine M., University of Cincinnati
Moss, David M., University of Connecticut

sissianne@aol.com

Can You Force Feed NOS Enlightenment? Two Experienced Secondary Teachers' Pedagogical Journey Teaching the Nature of Science

This year long case study focuses on two secondary science teachers' experiences while fostering the nature of science in their classrooms.

Kohlhaas, Kay A., University of Houston – Victoria
Lin, Hsin-Hui, University of Houston - Victoria
Chu, Kwang-Lee, Harcourt Assessment, Inc.

kohlhaask@uhv.edu

The Impact of Gender and Poverty on Elementary Science Performance

Data from the Early Childhood Longitudinal Study were utilized to explore gender and poverty with the science performance of third graders. Statistical significances were found.

Kraus, Rudolf V., Illinois Institute of Technology
Lederman, Norman G., Illinois Institute of Technology

rkraus@iit.edu

Implementing inquiry through coaching

Schools failing NCLB were offered an inquiry curriculum. This study hoped to overcome previous mixed results by using full-time coaches to find and solve problems.

Krissek, Lawrence, The Ohio State University
Sackes, Mesut, The Ohio State University
Trundle, Kathy C., The Ohio State University

krissek@mps.ohio-state.edu

Early Childhood Teachers' Understanding of the Earth Science Concepts Before and After Instruction

This study investigated the effects of an institute on PreK to Grade 2 teachers' understanding of earth science concepts they are expected to teach.

Kruse, Jerrid W., Iowa State University

jerridkruse@gmail.com

Integrating and Assessing Nature of Science Instruction in Middle Level Secondary Science.

Clough notes the need to continually scaffold along the decontentualized-contextualized continuum in NOS instruction. I will present implementation/assessment of this framework in middle grades.

Kuerbis, Paul J., Colorado College

pkuerbis@coloradocollege.edu

Mooney, Linda B., Harrison School District Two

Revak, Marie, Lewis Palmer School District

Getty, Steve, Biological Study Curriculum Study

Shaw, Jerome M., University of California, Santa Cruz

Nagashima, Sam O., University of California, Los Angeles

Designing and implementing science professional development that impacts classroom practices and (K-5) student achievement in science, writing, reading and mathematics.

This session reports on a reform effort in a urban-suburban area of central Colorado and four studies that substantiate the importance of quality professional development.

Kumar, David D., Florida Atlantic University

david@fau.edu

Morris, John D., Florida Atlantic University

Tobias, Karen, Sheridan Technical Center

Simulation Supported Learning and Teacher Conceptual Understanding of Current Electricity

Effect of simulations on the conceptual understanding of elementary and secondary teachers is reported. Results showed significant pre to post test gains, and two interactions.<p style="MARGIN-TOP: 0in; MARGIN-BOTTOM: 0in; tab: 1in"><p style="MARGIN-TOP:

Lamp, David, Texas Tech University

david.lamp@ttu.edu

Narayan, Ratna, Texas Tech University

Sinking and Floating With Elementary Preservice Science Teachers

The purpose of this study is to explore elementary preservice science teachers' understanding of 'Sink and Float' in a constructivist inquiry-based science content course.

Lankford, Deanna M., University of Missouri-Columbia Science Education Center
dml80@mizzou.edu

Challenging students to think 'outside the box'

This paper discusses the implementation of problem based learning to actively engage students in learning science, support life-learning skills, and provide application for knowledge.

Lee, Eunmi, Northwestern University
yjsmom@gmail.com

Learning by Doing: Curriculum Enactment and a Teacher's PCK

This paper explores how a teacher uses and adapts reform-based curriculum materials. It also examines how curriculum materials can support a teacher's PCK during enactment.

Libidinsky, Lisa J., Pembroke Pines-FSU Charter School lsalib@bellsouth.net
Kumar, David D., Florida Atlantic University
Altschuld, James W., Ohio State University

Effective Collaborative Efforts Between Colleges of Education and Science and K-12 Schools

Professionals in the colleges of science, colleges of education, and schools need to dialogue, collaborate, and be empowered to jointly prepare pre-service teachers.

Lightbody, Mary, The Ohio State University Newark Lightbody.1@osu.edu

On-Site Professional Development: Using Differentiation to Support Instruction in Middle School Science

This research investigated the degree to which science teachers modified their instruction before and after learning how to differentiate to meet the needs of students.

Lim, Gilsun, University of Iowa
Yager, Robert E., University of Iowa
gilsun-lim@uiowa.edu

The Effects of Constructivist Teaching Approach in Middle School Science Classrooms

A series of video recordings and questionnaire were used to verify effects of constructivist teaching approach in middle school science classrooms.

Lorsbach, Tony, Illinois State University

awlorsb@ilstu.edu

A school district's adoption of an elementary science curriculum and its implications for science educators

Presents the results of a case study of a school district's decisions and processes regarding adoption of a new curriculum.

Lott, Kimberly H., Utah State University

khlott@gmail.com

Science Excel: An Effective Teacher Recruitment Program for Rural Schools?

This study explored the possibility of using an Excel program to identify and recruit teachers into the profession at the secondary level.

Lotter, Christine R., University of South Carolina
Rushton, Greg, Kennesaw State University

lotter@gwm.sc.edu

Secondary Science Teachers' Beliefs and Use of Inquiry-based Instruction After a Year-long Professional Development Program

The research describes the influence of a year-long professional development program on secondary science teachers' beliefs and use of inquiry-based teaching practices.

Lumpe, Andrew T., Seattle Pacific University
Riley-Black, Dana, Center for Inquiry Science-Institute for Systems Biology

lumpea@spu.edu

A Professional Development Continuum for Science Education

A professional development continuum is outlined that describes the attributes of teachers while engaged in the implementation of innovative science programs.

Marbach-Ad, Gili, University of Maryland
McGinnis, J. Randy, University of Maryland
Benson, Spencer, University of Maryland

gilim@umd.edu

Schalk, Kelly A., University of Maryland
Dai, Amy, University of Maryland
Pease, Rebecca, University of Maryland

Connecting Learners' Area Of Interest In A Microbiology Course For Non-Majors And Teachers' Interns: Project Nexus (Y2)

A pedagogical innovation in an undergraduate microbiology course for non-majors (with teacher interns) is described. Student interest was used to enact "Teach for all."

Marrero, Meghan E., Teachers College, Columbia University/U.S. Satellite Laboratory, Inc.
mmarrero@us-satellite.net

Riccio, Jessica F., Teachers College, Columbia University
Woodruff, Karen A., U.S. Satellite Laboratory
Scuster, Glen S., U.S. Satellite Laboratory

Live, Online Professional Development: Creating Teacher Communities across Contexts

Study examines teacher views on the effectiveness of live and online 'Short-courses' teaching STEM content. Results suggest the format to be highly successful across contexts.

Marshall, Jeff C., Clemson University
marsha9@clemson.edu

4E x 2 Instructional Model: Uniting Three Learning Constructs to Improve Praxis in Science and Mathematics Classrooms

The proposed 4E x 2 Instructional Model provides a new paradigm created from three learning constructs to improve conceptual change through inquiry learning experiences.

Martin-Dunlop, Catherine, California State University, Long Beach
cmartin7@csulb.edu

Using Concept Maps to Assess Understanding of the Nature of Science

Using concept mapping for assessment in a course designed for prospective elementary teachers, students' representations of NOS were scored and then described in interpretive narratives.

Martin-Hansen, Lisa M., Georgia State University
lmartinhansen@gsu.edu
Placanica, Joseph V., Georgia State University
Kelty, Tom, California State University at Long Beach
Henriques, Laura, California State University at Long Beach

Identification of Earth Science Misconceptions Through Videotaped Interviews

Researchers identified common earth science misconceptions by creating and carrying out videotaped interviews focusing upon earth processes including erosion, deposition, and river systems.

Mason, Cheryl L., San Diego State University

cmason@mail.sdsu.edu

Sunal, Dennis W., University of Alabama

Sunal, Cynthia S, University of Alabama

Zollman, Dean, Kansas State University

Lardy, Corinne, San Diego State University

Reformation of Undergraduate Science Courses

Research-based PCK strategies and results from a national study of reformed and non-reformed undergraduate science courses, and issues of reform will be shared.

McCann, Florence F., University of Oklahoma

fmccann@sbcglobal.net

Pedersen, Jon E., University of Oklahoma

McCann, Patrick J., University of Oklahoma

Learning About Light: A Science Education - Electrical Engineering Collaboration

Pre-service elementary teachers enhanced their content knowledge as they advised engineers on the pedagogical efficacy of a “Teaching Spectrometer” being developed for K-5 outreach.

McConnell, Tom J., Michigan State University

tommac@msu.edu

Lundeberg, Mary A., Michigan State University

Koehler, Matthew J., Michigan State University

Eberhardt, Jan, Michigan State University

Video-based Teacher Reflection ? What is the real effect on reflections of inservice teachers?

This study examines the impact on reflections of pre-service teachers when teachers use videotaped records of practice as a tool for professional development.

McConnell, Tom J., Michigan State University

tommac@msu.edu

Stanaway, Jeannine C., Michigan State University

Parker, Joyce M., Michigan State University

Eberhardt, Jan, Michigan State University

Influencing pedagogical content knowledge of inservice science teachers through problem-based learning

This study examines the influence of literature research and discourse with peers on the science PCK of practicing teachers engaged in problem-based learning.

McCormack, Alan J., San Diego State University

amccorma@mail.sdsu.edu

Hogwart's Academy for Teachers: Inspiring Teachers with Magic and Science Based on the Harry Potter Series

Magic and fantasy from the Harry Potter stories are used in a preservice methods course as springboards to exciting science lessons for K-6 children.

McDermott, Mark A., University of Iowa

mcdermott.mark@iccsd.k12.ia.us

Hand, Brian, University of Iowa

A Secondary Analysis of Writing-to-Learn Studies in Science: Focus on the Student Voice

Student interviews from writing-to-learn studies in science were analyzed to determine connections between what students say about writing-to-learn experiences and cognitive models of writing.

McDonald, Eric J., University of Minnesota

mcdon414@umn.edu

New Teachers in Alternative Environments, Preparation for Perseverance

This paper reports interviews addressing the lived experience of new teachers who have persevered in alternative environments. How this informs teacher preparation programs is discussed.

McGregor, Lynette, Wartburg College

lynette.mcgregor@wartburg.edu

The Evolution of Undergraduate Science Education Research Conducted by Pre-Service Teachers at a Liberal Arts College

As the senior research capstone requirement for their science major, undergraduate pre-service science teachers plan, conduct and present science education research.

McNicholl, Jane, University of Oxford

jane.mcnicholl@edstud.ox.ac.uk

Childs, Ann, University of Oxford

Learning science to teach science: the role of school subject departments in ITE

This study reports a naturalistic study within two secondary school science departments that investigated the factors that afford student-teachers' learning of subject specific pedagogical knowledge.

Meadows, Lee, University of Alabama at Birmingham lmeadows@uab.edu
Eick, Charles J., Auburn University
Guy, Mark, University of North Dakota
Czerniak, Charlene M., University of Toledo
Jablon, Paul, Lesley University
Townsend, Scott, Eastern Kentucky University
Melear, Claudia, University of Tennessee

Back to the Trenches: Teacher Educators and the Impact of Returning to Classroom Practice (A Panel Discussion)

The panelists have become science teachers again, many via sabbaticals as full time teachers. We focus on the implications for science teacher education.

Melear, Claudia T., The University of Tennessee ctmelear@utk.edu
Perkins, Matthew P., The University of Tennessee

Teachers as Scientists: What Teachers Learn from Experiences in Scientific Laboratories

Each summer a distinguished national laboratory enlists inservice teachers to assist professional scientists in their research. How do these experiences influence their view of science?

Melville, Wayne S., Lakehead University wmelvill@lakeheadu.ca
Bartley, Anthony, Lakehead University

Biography and the teaching of science as inquiry.

Our research investigates the role of personal biography in the promotion of science as inquiry across three generations of science teachers within Thunder Bay, Ontario.

Meyer, Janice D., University of Houston Clear Lake meyerj@uhcl.edu
Weiser, Brenda, University of Houston Clear Lake

Engaging Pre-Service Teachers in Professional Development

This session discusses part of a study that investigates the impact of participation by preservice teachers in professional development on their practice as inservice teachers.

Miller, Brant G., University of Minnesota

mill3770@umn.edu

RET Site: Inspiring Educators in Rural America through Research

Research Experience for Teachers programs represent a paradigm shift in science teacher professional development. Gain insight into successful program implementation strategies and lessons learned.

Miller, Maria D., SUNY Fredonia

Maria.Miller@fredonia.edu

Science Self-Efficacy Perceptions in Minority Female Science Students

Racial/ethnic females exhibit patterns of opting out of upper-level secondary science coursework. The paper targets female minorities and their self-efficacy in secondary science education settings.

Minogue, James, North Carolina State University

minogue8@gmail.com

What is the Teacher Doing? What are the Students Doing?

This study documents the use of the Draw-a-Science-Teacher-Test as diagnostic tool for both preservice teacher beliefs about science instruction and science methods course effectiveness.

Miranda, Rommel J., Towson University

rmiranda@towson.edu

Urban Stakeholders' Perceptions of Quality in Science Teaching

This qualitative study sought to determine urban stakeholders' views of what constitutes high quality in science teaching in urban high school settings.

Monet, Julie A., California State University Chico

jmonet@csuchico.edu

Etkina, Eugenia, Rutgers the State University of New Jersey

Using Structured Journals to Improve Conceptual Understanding of Science Content

In-service middle school teachers use structured journals to deepen their conceptual understanding of science content and ability to reason from evidence.

Moore, Felicia M., Teachers College, Columbia University
Riccio, Jessica F., Teachers College, Columbia University
Catlin, Janell N., Teachers College, Columbia University

moorefe@tc.columbia.edu

Strategies for Learning and Enhancing Scientific Literacy in Science Education

This interactive symposium highlights use of digital photos and content-based literacy approaches to enhance science learning experiences for urban preservice teachers and middle school students.

Morrell, Patricia D., University of Portland

morrell@up.edu

“Project”ing EE into Elementary Preservice Programs

This paper set explores a variety ways to use Projects Wet, Wild and Learning Tree to help prepare elementary preservice teachers teach environmental education. Please note that all authors are listed here (rather than in alphabetic order with the other papers) to maintain the integrity of this paper set.

Morrell, Patricia D., University of Portland

Linking Literacy with the Project Guides

Preservice teachers used lessons from the Projects as a starting point and saw how easily they could incorporate both literacy and mathematical skills into the lessons.

Schepige, Adele, Wesern Oregon University

schepia@wou.edu

Lessons from pre-service teachers: Project Guides Implementation and Reflections

This paper focuses on how the pre-service teachers implement the guides in their field classes and reflect on the experience.

Morrison, Judith A., Washington State University TriCities

jmorriso@tricity.wsu.edu

Developing the PLT Activity "Planet Diversity"

Using PLT activities, preservice teachers were engaged in both designing field investigations and explaining the earth's rotation.

Smith-Walters, Cindi, Middle Tennessee State University

ksadler@mtsu.edu

Sadler, Kim Cleary, Middle Tennessee State University

Getting WILD with K-8 Preservice Teachers in a Life Science Course

This paper will describe the integration of environmental education curriculum materials into a pre-service elementary life science course to improve student confidence and knowledge.

Munck, Miriam, Eastern Oregon University

mmunck@eou.edu

Rainboth, Donna, Eastern Oregon University

Using Project Guides to Promote and Facilitate Developmental Inquiry

Lessons from WET and PLT were used to introduce inquiry, analyze the inquiry components of lessons, and modifying lessons to fit the inquiry model.

Dimeo-Ediger, Norie, Oregon Forest Resources Institute dimeo-ediger@ofri.com
Sahnaw, Susan, Oregon State University

Communities of Practice-A Social Context for Creating Best Practices

This paper describes the efforts of Oregon university faculty in creating a community of practice that was identified as the pre-service consortium.

Paznokas, Linda, Washington State University lpaznokas@wsu.edu

Pre-Service Teacher Environmental Education Project

This paper describes the development of the Pre-Service Teacher Environmental Education Project, which established communication and collaboration across 18 universities responsible for science teacher preparation.

Morrisette, Sharon J., University of Illinois- Urbana/Champaign morristt@uiuc.edu

Preservice Teachers' Web-Based Inquiry Science Units And A Critique Of Why They Did Not Use "New Media".

This article focuses on the web-based inquiry science units that elementary preservice teachers produced for me their instructor and a small survey that they completed.

Morrison, Judith A., Washington State University jmorriso@tricity.wsu.edu

Teachers' Conversations with Scientists about Teaching Science

After conversations with scientists about teaching/learning science, teachers reported changes in their ideas about students' understanding of science and how they would teach science.

Moscovici, Hedy, California State University - Dominguez Hills hmoscovici@csudh.edu

Osioma, Irene, California State University - Dominguez Hills

Tucker, Susan, Evaluation & Development Associates, San Francisco, CA

Collaborative Science Professional Development in Urban Centers: Challenges and Solutions

This study explores the effect of a collaborative professional development with follow-ups on the ability of practicing teachers to use inquiry science in their classrooms.

Moscovici, Hedy, California State University - Dominguez Hills hmoscovici@csudh.edu

Osioma, Irene, California State University - Dominguez Hills

Designing the Best Preservice Urban Elementary Science Methods Course ? Dilemmas and Considerations

This paper addresses the dilemmas encountered by two secondary science faculty designing a course for urban pre-service elementary teachers.

Mueller, Michael P., University of Georgia

mmueller@uga.edu

The Case for Chet Bowers' Ecojustice Philosophy in Science Education

This philosophical research argues that Chet Bowers' ethical theory of ecojustice should play a vital role in science education to renew and revitalize the commons.

Mumba, Frackson, Southern Illinois University

frackson@siu.edu

Chabalengula, Vivien M., Southern Illinois University, Dept. C&I Carbondale, IL 62901

Hunter, William J. F., Illinois State University, Dept of Chemistry, Normal, IL 61790

Graphing Skills Among Pre-Service Elementary Science Teachers

This study assessed the effect of explicit instruction on graphing on pre-service teachers. Experimental group performed better than control group. Both groups showed graphing preferences.

Muskin, Joseph, Nano-CEMMS, University of Illinois

jmuskin@uiuc.edu

Hug, Barbara, College of Education, University of Illinois

Carroll, Kathleen, Nano-CEMMS, University of Illinois

Grenda, Patrick, Nano-CEMMS, University of Illinois

Integrating Nanoscience into Secondary Education: A model for curriculum development using a wide range of experts

We describe innovative programs integrating nanoscience into school curriculum involving individuals at all levels of education from students, undergraduates, teachers, graduate students, researchers, and professors.

Nam, Younkyeong, University of Minnesota

namxx020@umn.edu

Developing a Systems Thinking Framework for Teacher Education in Earth System Context

This paper proposes a systems thinking framework for teacher education in earth system context

by integrating earth systems framework and systems thinking framework.

Nehm, Ross H., The Ohio State University

rnehm@ccny.cuny.edu

The effects of explicit NOS instruction on biology teachers' misconceptions about evolution

This proposal reports on an intervention study designed to increase biology teachers' NOS knowledge and to evaluate its effects on evolutionary understanding.

Nelson, Tamara H., Washington State University Vancouver

tnelson@vancouver.wsu.edu

Waters, Charlotte, Heritage High School

Schaadt, Anne, Chinook Middle School

White, Kristin, Shahala Middle School

Learning about science teaching, learning, and standards through collaborative inquiry.

Secondary science teachers engaged in collaborative inquiry to better understand how to help students be more successful in relation to science standards.

Nichols, Dianne K., Education Queensland

dianne.nichols@postgrad.curtin.edu.au

Appleton, Ken, Central Queensland University

Teaching Literacy in the Middle Years Using Science as the Host

This study traces a group of middleschool science teachers from schools within Biloela, Australia, who implemented broad strategies for literacy development in their science lessons.

Norman, Kathy I., California State University San Marcos knorman@csusm.edu

Flores, Ingrid M., California State University San Marcos

Integrating the Visual and Performing Arts Standards into Science and Math Methods

Presenters will share lesson activities in science and math methods that infuse the visual and performing arts, and describe their arts-integrated credential program.

Notebaert, Andrew, University of Iowa

andrew-notebaert@uiowa.edu

Implications for using student centered teaching methods in anatomy education

Educators using student centered methods instead of traditional methods may promote a deeper

understanding of science, particularly human anatomy, and may increase interest in science.

O'Brien, Thomas P., Binghamton University

tobrien@binghamton.edu

The Nature Of Science via Paper and Pencil Puzzles

Paper and pencil puzzles that develop teachers' content and pedagogical content knowledge about the nature of science will be modeled with active engagement of participants.

O'Sullivan, Kathleen A., San Francisco State University (emerita)

kaosul@sfsu.edu

DeVore, Edna, SETI Institute

Harman, Pamela, SETI Institute

ASSET: Use of the Design Framework for successful professional development institutes

Using the Design Framework (Loucks-Horsley et al, 2003) led to successful summer institutes on astrobiology for teachers (ASSET). Planning, implementation, and assessments are addressed.

Olson, Eric A., State University of New York – Oswego

olson@oswego.edu

Consumer Product Testing as a means of promoting authentic inquiry in adolescent and childhood science methods classes.

Consumer product testing in methods courses challenges students to design their own authentic investigation, promoting understanding of science, technology and social justice.

Olson, Eric A., State University of New York – Oswego

olson@oswego.edu

Professional development for science teachers using a constructivist framework

Presentation will focus on the framework and results of a 6 year long professional development inquiry group with a group of urban high-needs teachers.

Olson, Joanne K., Iowa State University

jkolson@iastate

Clough, Michael P., Iowa State University

Vanderlinden, David, Des Moines Area Community College

The Entangled Nature of Students' NOS Conceptions

Even when historical stories explicitly draw attention to key NOS ideas, students may use other

general and NOS specific misconceptions to resist desired conceptual change.

Olson, Joanne K., Iowa State University

jkolson@iastate

Elementary Teachers Gone Wild? Preservice Teachers' Self-Portrayals on the Internet and Public Expectations of Elementary Teachers

This study analyzed preservice teachers' publicly-accessible webpages to determine the extent to which they model the good character expected by parents and public schools.

Osisoma, Irene U., Division of Teacher Education, California State University Dominguez Hills
iosisioma@csudh.edu

Moscovici, Hedy, Division of Teacher Education, California State University, Dominguez Hills,
Carson, California

Ndunda, Mutindi, School of Education, College of Charleston, Charleston, South Carolina

Critical Issues in Urban High Schools: Exploring Factors That Influence Students' Achievement in Mathematics and Science.

This study compares the contextual factors that are prevalent in two urban schools and explores how these influence the students' achievement in mathematics and science.

Pagan, Tina W., University Of Georgia, Department Of Mathematics & Science Education
tpagan@enr.uga.edu

Understanding River Advocacy: Suggestions for Building Human-River Relationships with High School and College Students

This presentation describes how river advocates understand their relationship with a river. Research findings provide suggestions on how educators can build human-river relationships with students.

Park, Soonhye, University of Iowa
Chen, Ying-Chih, University of Iowa

soonhye-park@uiowa.edu

Developing Measures of Teachers Pedagogical Content Knowledge for Teaching High School Biology

This roundtable session is to discuss the procedure by which measures of teachers' pedagogical content knowledge for teaching high school biology were developed and validated.

Rogers, Meredith A. Park, Indiana University

mparkrog@indiana.edu

Developing preservice elementary teachers' understanding of science as argument and explanation: Rethinking appropriate methods

This action research study examines the design of an assignment given to elementary preservice teachers' for developing their abilities in using evidence to formulate explanations.

Parrish, Jennifer L., University of Northern Colorado

jenniferparrish22@yahoo.com

Saunders, Gerald, Unity College, Unity Maine

Higgins, Teresa, University of Northern Colorado, Greeley, Colorado

The Effect of Tiered Lessons on Academic Achievement in an 8th Grade Physical Science Classroom as Measured by Assessment Performance

This study examined one method of curriculum differentiation, lessons tiered by readiness, for effectiveness in improvement of student achievement in a middle school science classroom.

Paulson, Patricia C., Bethel University

patricia-paulson@bethel.edu

The Inquiry-Based Elementary Science Methods Course: What Attitudes Do Preservice Teachers Bring To The Experience And How Prepared Do They Feel Upon Completion?

Preservice teacher reflections describe initial attitudes, struggles with inquiry, perceived lack of content knowledge, inability to focus lesson outcomes, and frustrations with developing quality assessments.

Payne, Diana L., University of Connecticut

diana.payne@uconn.edu

Changes in Science Teacher Beliefs About Science and Science Teaching After Participation in a Teacher Research Experience

This concurrent mixed methods study examined the impact of a Teacher Research Experience (TRE) on science teacher beliefs about science, scientific research, and science teaching.

Pease, Rebecca S., University of Maryland

rspease@umd.edu

Holliday, William G., University of Maryland

Sheckells, Daniel J., University of Maryland

Assisting Science Educators Searching for Research-based Information

Prototypical tools designed to assist educators in search of relevant research-based articles published in two, top-rated science education journals are described and analyzed.

Pegg, Jerine M., University of Idaho

peggj@uidaho.edu

An Examination of Students' Causal Reasoning in Written Explanations Involving Theory Articulation

In this study, a method of analyzing students' written explanations was developed for identifying patterns in causal reasoning during a theory articulation inquiry task.

Pegg, Jerine M., University of Idaho

peggj@uidaho.edu

Adams, Anne, University of Idaho

McConnell, Rodney, University of Idaho

An Initial Survey of Secondary Science and Mathematics Teachers Content Area Literacy Practices

This paper describes the development and initial results from a survey of content area literacy practices of secondary science and mathematics teachers.

Perkins, Catherine J., Oregon State University

cperkins@archdpdx.org

Attaching the Meaning: Exploring the Perspectives and Methodologies of Science Teaching Self-Efficacy

This presentation reviews the past science teaching self-efficacy research and offers a glimpse into how the power of efficacy can be explored in the future.

Pinder, Patrice J., Morgan State University

patricepinder@comcast.net

A Critique Analysis of NCLB, Increase Testing, and Past Maryland Science and Mathematics HSA Exams: What are Maryland Practitioners' Perspectives?

The study essentially explored and sought to understand some of Maryland's mathematics and science practitioners' perspectives on increase testing, NCLB, and past Maryland assessments.

Pinder, Patrice J., Morgan state University

patricepinder@comcast.net

Teaching the Concept of Animate Versus Inanimate Objects to k-1 Students: Can Game Playing Facilitate Younger Students' Conceptualization of Biology Concepts?

This study discusses the implementation of game board activities as apart of a school lesson. Positive effects of game playing on science achievement are explored.

Pomeroy, J. Richard, University of California, Davis jrpomeroy@ucdavis.edu
Smolleck, Lori, Department of Education Bucknell University

Best Practice-What I didn't learn about teaching and supervision from my mentor

Experienced faculty will share best practices about teaching and supervision for new faculty and soon to finish graduate students

Posnanski, Tracy J., University of Wisconsin-Milwaukee tjp@uwm.edu

Balancing Literacy in Elementary Science Classrooms (Project BLESC)

This presentation will discuss the implementation and evaluation of a program for elementary teachers that developed literacy instructional skills with language arts and science.

Preczewski, Paul J., Syracuse University pjprecze@syr.edu
Tillotson, John W., Syracuse University
Young, Monica J., Syracuse University

Determination and correlation of factors influencing the Reformed Science Teaching and Learning Questionnaire

Using principle factors analysis, the IMPPACT Project found the new BARSTL questionnaire shows four factors not congruous with the prescribed BARSTL subscales.

Ramsey, Sarah J., The University of North Carolina at Charlotte sramsey3@uncc.edu

The Culture of Inquiry in Elementary Classrooms

In this study, elementary teachers communicated a culture of inquiry based on autonomy, respect, trust, critical thinking, dialogue, questioning, and learning through experience.

Rivas, Mike G., California State University, Northridge mike.rivas@csun.edu

The Nature of Science and the Preservice Elementary Teacher: Changes in Understanding and Practice

This action research project attempted to enhance the understanding of specific nature of science tenets to promote equity and access in the science classroom.

Robinson, Scott D., University of Hawaii at Manoa scottdr@hawaii.edu

A Narrative Inquiry of Two Student Teachers: Impact, Mentorship, & Identity

The qualitative study explores two student teachers' impact on pupil learning, perceptions of being mentored, and professional identity development.

Rodney, Desmond, Miami Dade College drodney@comcast.net
Kumar, David, Florida Atlantic University
Binder, Andrew, Florida Atlantic University

Synchronized Instructional Video Observation System (SIVOS): Analyzing TIMSS Classroom Interactions

This paper deals with the development and research involving the Synchronized Instructional Video Observation System (SIVOS) to investigate foundational principles of instruction in classroom settings.

Ross, Donna L., San Diego State University DLRoss@mail.sdsu.edu

Integrating Literacy and Secondary Science: The Real Deal

Results of team-teaching high school biology and English using podcasts, fiction, and non-fiction related to science instead of simply adding informational text strategies.

Sackes, Mesut, The Ohio State University sakes.1@osu.edu
Trundle, Kathy C., The Ohio State University
Krissek, Lawrence, The Ohio State University

Early Childhood Teachers' Understanding of the Lunar Concepts Before and After Instruction

This reports the effects of a short-term instruction on teachers' understanding of lunar concepts for PreK to grade 2 education.

Sadler, Troy D., University of Florida tsadler@coe.ufl.edu

Science for Life: A Multidisciplinary Program to Strengthen and Transform Undergraduate Science Education

This poster presentation will provide an overview and emerging results of a multidisciplinary program designed to transform science education at a research extensive university.

Sanalan, Vehbi A., Ohio State University
Irving, Kare E., Ohio State University
Pape, Stephen J., University of Florida
Owens, Douglas T., Ohio State University

sanalavi@gmail.com

Classroom Communication Technology in Science: A Multi-faceted Professional Development Program

This paper presents the design and initial evaluation of a multi-faceted professional development program for connected classroom technology implementation in physical science classrooms.

Sawey, April T., Texas Christian University
Holden, Mary E., Texas Christian University
Bloom, Mark A., Texas Christian University
Weinburgh, Molly H., Texas Christian University
Huckaby, M. Francyne, Texas Christian University

a.t.sawey@tcu.edu

Pre-service Teachers' Conception and Application of Inquiry and Nature of Science

Pre-service teachers' conceptions of inquiry and nature of science and their application of these concepts in teaching were investigated following methods courses emphasizing their use.

Scantlebury, Kathryn Kate, University of Delaware
Gallo-Fox, Jennifer, University of Delaware

kscantle@udel.edu

Coteaching in a Secondary Science Professional Development School

This paper examines the use of coteaching as a professional development experience for cooperating and student teachers within a secondary science professional school.

Scarola, Kimberly K., Pembroke Pines Charter School
Kumar, David D., Florida Atlantic University

kscarola@pinescharter.com

Closed Captions for Teaching Nanotechnology to Students with Special Needs

This presentation argues for using closed captions for teaching nanotechnology to students with

special needs (ESE, ESL). Curriculum and instructional implications are included.

Schack, Mark B., Morehead State University

m.schack@morehead-st.edu

Students Join the Search for Intelligent Life in the Universe

The SETI@home project is an ongoing experiment using computers on the Internet to process data captured by the Arecibo radio telescope in Puerto Rico.

Schroeder, Cindy J., The Ohio State University

schroeder.224@osu.edu

Trundle, Kathy Cabe, The Ohio State University

What is Informal Science Education and how can it be Effective for Learning?

This literature review defines informal science learning, describes types of informal settings, includes results of effective and ineffective science programs and suggests future research.

Schwartz, Renee S., Western Michigan University

r.schwartz@wmich.edu

Skjold, Brandy, Western Michigan University

Hong Hang-Hwa, Western Michigan University

George, Akom, Western Michigan University

Fang, Huang, Western Michigan University

Kagumba, Robert, Western Michigan University

Exploring the professional development of science teacher educators: Graduate students' journeys to embrace NOS

We explore influences on NOS conceptions and commitments to NOS teaching during science education graduate studies. Findings relate to self awareness, motivation, and culture.

Scott, Anna K., University of Georgia

akscott@uga.edu

Recesso, Art M., University of Georgia, Learning Performance and Support Laboratory

Oliver, Steve, University of Georgia, Department of Mathematics and Science Education

Using the Video Analysis Tool to Prompt Critical Reflection in Science Teacher Education

We share how we used a technological innovation, the Video Analysis Tool in aiding the development of core identity in our course for student teachers.

Sederberg, David, Purdue University

dsederbe@purdue.edu

Bryan, Lynn A., Purdue University

Giordano, Nicholas, Purdue University

Teaching and Learning About Ferrofluids in the High School Science Classroom

In this experiential session, we will engage science teacher educators in part of a ferrofluids lesson that we developed for high school science.

Seiler, Gale, McGill University
Emdin, Christopher, Teachers College
Elmesky, Rowhea, Washington University in St. Louis

gale.seiler@mcgill.ca

Hybridized Teacher And Student Identities, Creolized Science And Emotionality In Urban Science Classrooms

Three studies provide classroom examples of the generation of hybrid communities of creolized science and the central role of teacher identity hybridization in this process.

Settlage, John, Univ of Connecticut
Odom, Louis, Univ Missouri-Kansas City

john.settlage@uconn.edu

Learning Cycle: Bringing in Diversity and Building an Updated Assessment Tool

Updates to the Learning Cycle in terms of multicultural considerations, educational theory, and assessment procedures are all included within this session. Field test sites needed.

Seung, Eulsun, Indiana State University
Bryan, Lynn A., Purdue University
Haugan, Mark P., Purdue University

esseung@gmail.com

Factors That Influence Physics TAs' Knowledge Development for Teaching a Novel Physics Curriculum

This study explored factors that influenced physics teaching assistants' development of professional knowledge as they learned to teach a novel physics curriculum.

Shanahan, Therese B., UC Irvine
Hyde, Karajean, UC Irvine
Marshall, Sue K., UC Irvine

tshanaha@uci.edu

Early Development of a Student-Centered Perspective in Science and Math Pre-Service Teachers

This study investigates the influence of instructor modeling on future math and science teachers'

student-centered perspective as evidenced in planning and reflecting on classroom lessons.

Shane, Joseph W., Shippensburg University of Pennsylvania jwshan@ship.edu

Coupling Hermeneutics And Narrative Analysis In Teacher-Centered Qualitative Research

Hermeneutics and narrative analysis are discussed as complementary theoretical frameworks for defining the researcher's roles and for representing the results of teacher-centered qualitative inquiries.

Sharkawy, Azza, Queen's University sharkawa@educ.queensu.ca

Students' stereotypic images of scientists: moving beyond stereotypes

This qualitative study examines the influence of stories about scientists from diverse socio-cultural backgrounds (i.e., class, gender) on grade one students' images of scientists.

Sheppard, Keith, Stony Brook University keith.sheppard@stonybrook.edu

The History of Science Education: A Call for Inclusion.

This position paper advocates for the inclusion of more science educational history in introductory science teacher education methods courses.

Shope, Richard, Jet Propulsion Laboratory, Principal Investigator, Arctica Science Research
Projects for Urban Youth mime@shope.com
Brown, Shakira, Urban Science Corps

Science Coaching for Urban Youth: Reporting Results of the Implementation of the Urban Science Corps Nationwide

We report on the results of a nationwide project to engage urban youth in scientific inquiry bringing together Scientists and Science Educators as project teams.

Shume, Teresa J., Minnesota State University Moorhead shume@mnstate.edu

Computer Savvy but Technologically Illiterate: Rethinking Technology Literacy

This position paper seeks to reconceptualize technology literacy in the context of democracy, commercialism in electronic media, and ecological sustainability.

Video Cases of Whole-Class Inquiry

We propose to present video case segments developed from research on an enactment of the “whole-class inquiry” curriculum, and obtain reactions and feedback from attendees.

Smolleck, Lori D., Bucknell University

lsmollec@bucknell.edu

From Science Methods to Student Teaching: Changes in Self-Efficacy

This research follows five preservice elementary teachers through one academic year to determine how a science methods course and student teaching impact self-efficacy beliefs.

Spector, Barbara S., University of South Florida

spector@coedu.usf.edu

Zimmerman, Timothy D., Lawrence Hall of Science, University of California-Berkeley,

Hotaling, Liesl, Stevens Institute of Technology

Sullivan, Deidre, Monterey Peninsula College, Marine Advanced Techno

McDonnell, Janice, Rutgers University Education and Outreach

Thomas, Carrie, North Carolina State University Dept of Marine, Ea

Duncan, Ravit G., Rutgers University, Graduate School of Education

Helping Teachers Bring Ocean Sciences into the Science Classroom: The Role of the Centers for Ocean Science Education Excellence (COSEE)

How COSEE can assist science teacher educators with content, processes, technology, partnerships, and human and material resources will be discussed in a five part panel

Staples, Kimberly A., Kansas State University

kstaples@ksu.edu

Developing Multicultural Competencies Among Pre-Service Teachers of Science Through Interactive Evaluation of Children’s Literature

This study describes the effect of an interactive approach to critiquing children’s literature on pre-service teacher multicultural competencies to enhance science instruction for “ALL” learners

Steiner, Robert V., American Museum of Natural History

rsteiner@amnh.org

Online Resources from the American Museum of Natural History

An array of accessible and innovative science education resources from the American Museum of Natural History is discussed, including online courses for teacher education.

Stratton, Susan K., SUNY Cortland

strattons@cortland.edu

Richard Louv’s “Last Child in the Woods: Saving our Children from Nature Deficit Disorder”: Implications for Teachers

Session discusses issues in Richard Louv’s book, Last Child in the Woods. Discussion geared for both those who have and have not read the book.

Stroupe, David A., University of Houston

dastroup@mail.uh.edu

“As the Solar System orbits the Earth”: Do urban high school science teachers know their science content?

Twenty-six high school science teachers in Houston took the 2005 NAEP science exam. Their results necessitate debate about the future of effective urban science teaching.

Subramaniam, Karthigeyan, Penn State Harrisburg

kus19@psu.edu

Theory to Practice Transitions: Mapping the apprenticeship experiences of preservice teachers during the science methods field experience.

The purpose of this study was to investigate the nature of the apprenticeship between preservice teachers and their university-based teacher educator during field experiences.

Svec, Michael T., Furman University

michael.svec@furman.edu

Using international science education case narratives

Describes the use of case-based pedagogies using an international context to engage pre-service and practicing teachers in critical reflection and decision making.

Talsma, Valerie L., Northern Illinois University

vtalsma@niu.edu

A Spider is an Animal? Elementary teacher candidates’ ideas of “what is an animal?”

Explores teacher candidates’ ideas of animals in an introductory activity prior to a course assignment where they investigate children’s ideas in science.

Thomas, Jeff A., University of Southern Indiana

jathomas@usi.edu

Perspectives into using videocases in science methods training for preservice elementary teachers.

A group of preservice elementary teachers recently used online videocases to investigate how students learn about electricity. This proposal summarizes their perception of the experience.

Thomas, Julie, Oklahoma State University

jtbirdwatcher@gmail.com

Pintail Partners: A Case Study in the Development of a Model for the Professional Development of Classroom Teachers in STEM Fields

This case study proposes a model of teacher professional development in STEM that focuses on research partnerships, informal learning opportunities, and professional learning communities.

Thomas, Susan Elizabeth, The University of Alabama
Stanton, Marietta P., The University of Alabama
Lammon, Carol B., The University of Alabama

beththomas@bama.ua.edu

I'm Not A Nurse, I'm A Science Teacher Educator: A Collaborative Effort To Address A Shortage Of Nurse Educators

To address America's nursing shortage, Colleges of Education and Nursing are collaborating to produce nurse educators. This innovative program's liaison is a science teacher educator.

Thomson, Norman F., University of Georgia

nthomson@uga.edu

Chomchid, Panwilai, Kasetsart University, Bangkok, Thailand

Developing and Investigating VAST-Models for Learning Atomic Structure: What do Students Learn and Use?

Models are essential for doing chemistry. We are developing and investigating VAST-Models and video animations for learning atomic structure: What do students learn and use?

Tippins, Deborah J., University of Georgia

dtippins@uga.edu

Johnson, Amy, University of South Carolina
Hodges, Georgia, University of Georgia

Living on the Back Street: Pathways to science education in a rural Georgia Community

The purpose of this action ethnography is to understand the impact of segregation on educational opportunity and science literacy learning in a rural community.

Tippins, Deborah J., University of Georgia dtippins@uga.edu
Handa, Vicente C., West Visayas State University, Iloilo City, Phillipines

Community immersion: Answering the call for relevance in science teacher preparation

Using collaborative action ethnography we explore questions of 'relevance' in relation to community immersion, a science teacher preparation model which integrates discourses of social justice.

Tobin, Kenneth G., Graduate Center of CUNY ktobin@gc.cuny.edu
Emdin, Christopher, Teacher's College, Columbia University
Pitts, Wesley, Lehman College, CUNY
Shady, Ashraf, The Graduate Center of CUNY
Bayne, Gillian, Lehman College, CUNY

Producing success in science through culturally adaptive teaching and learning

Students, teachers, and the nature of science change in a longitudinal program of research in urban schools that employed cogenerative dialogues to produce success.

Toolin, Regina E., University of Vermont Rtoolin@UVM.Edu
Flank, Sandra, Pace University

A Tale of Two City Schools: Supporting project-based inquiry in secondary science education

This study examines the process by which two secondary schools in New York State develop and implement project-based inquiry in their science curriculum.

Townsend, Jeffery S., Eastern Kentucky University scott.townsend@eku.edu
Boone, William J., Miami University

Teachers' Reporting of Factors Which Positively Impacted Their Science Teacher Preparation

A school-based, experiential science methods class has a more long-term, positive impact on teachers' epistemological foundations. A mixed methods approach with Rasch Analysis was utilized.

Trautmann, Nancy M., Cornell University nmt2@cornell.edu
Bodzin, Alec M., Lehigh University

Blank, Lisa M., University of Montana
MaKinster, James G, Hobart and William Smith Colleges
Crews, Jeff, University of Montana
Loehman, Rachel, University of Montana
Knuth, Randy, University of Montana

Professional Development Models Using Geospatial Technologies

Delineation of three professional development models, each designed to promote curricular integration of geospatial technologies including GIS and Google Earth into secondary science teaching.

Tse, Kenneth, University of Southern California ktse68@gmail.com

Middle School Science Teachers' Pedagogical Response To High Stakes Accountability: A Multiple Case Study

A multiple case study examined how middle school science teachers reacted to the current high stakes accountability and standardized testing in California.

Tuckey, Steven F., Michigan State University tuckeys1@msu.edu
Kang, Hosun, Michigan State University
Merritt, Kelly M., Michigan State University

Framing the discussion and future research on science literacy

This paper presents a theoretical framework relating research traditions in literacy and science education through commonplaces for discussion, and proposes strong sites for future research.

Turner, Tommie Y., Washington University in St. Louis tturner@wustl.edu
Galganski, Martha H., Washington University in St. Louis
Hogrebe, Mark, Washington Universtiy in St. Louis

A Teacher Questionnaire Reflecting Teachers' Beliefs and Perceptions of their Best Practices in Science Teaching through Lesson Study.

Our research establishes a sustained collaboration between local elementary teachers and informal science educators to enhance teachers' practice and beliefs in classroom science instruction.

Upadhyay, Bhaskar, University of Minnesota upadh006@umn.edu
Fortney, Brian, University of Texas at Austin

Kirchhoff, Allison, University of Minnesota
Ryan, Mark, University of Minnesota

Assessing Preservice Elementary Teachers' Personal and Professional Beliefs About Diversity During and After Science Methods Course

This study shows that elementary pre-service teachers' personal beliefs about diversity during science methods courses don't change but their professional beliefs about diversity do change.

Upadhyay, Bhaskar, University of Minnesota

upadh006@umn.edu

Culturally-Sensitive Pedagogy: A Case Study of Hmong Elementary Teacher

This study explores how a Hmong female elementary teacher enacts culturally-sensitive pedagogy to teach science to empower students from minority groups.

Valanides, Nicos, Department of Education, University of Cyprus nichri@ucy.ac.cy
Angeli, Charoula, Department of Education, University of Cyprus

Examining Learners' Reasoning in a Text-Based Online Conference for a Science Education Course

The study reports on students' reasoning when they were asked to participate in a text-based online conference to resolve conflicting ideas about a puzzling observation.

Verma, Geeta, Georgia State University

gverma@gsu.edu

Hernandez, Gypsy, Gwinnett County Public Schools, GA

McCrary, Termerion, Atlanta Public Schools, GA

Mcdowell, Amy, Douglas County School System, GA

Miller, Katrina, Clayton County Public Schools, GA

Voss, Kelly, DeKalb County Schools

Using case based pedagogy for professional development in science education

Study explored science teachers' engagement in case-based pedagogy. Data included participants' case narratives and discussion postings. The narratives intersected their professional work and personal struggles.

Veronesi, Peter, State University of New York, College at Brockport

pverones@brockport.edu

Digital Video Editing: Reflections on Effective Teaching Using iMovies.

Science teacher candidates were provided a camcorder, 256GB-HD, and iMovie and asked to self-reflect on their teaching of NSTA (SPA) criteria and effective teaching strategies.

Vincent, Daniel E., University of Central Oklahoma dvincent@ucok.edu
Allan, Elizabeth A., University of Central Oklahoma
Babb, Marie E., University of Central Oklahoma

Connecting the Content: Merging Pedagogy with Content Knowledge

This paper reports on a project that aligned a content course and a methods course for elementary teachers to be able to teach science effectively.

Viviano, Carolyn M., Loyola Marymount University cviviano@lmu.edu

Curriculum Development as a Relevant Learning Experience for Pre-Service Elementary Teachers

This poster presents the benefits and outcomes of a pilot project in which pre-service elementary teachers were required to create, evaluate and teach science curriculum.

Volkman, Mark, University of Missouri-Columbia volkmanmj@missouri.edu
West, Andrew, University of Missouri-Columbia

Structuring Professional Development in Physics Through Lesson Study

Most teachers plan and teach lessons in private. Lesson study is a teacher-led professional development strategy where teachers collaboratively design research lessons to support student learning.

Wavering, Michael J., University of Arkansas wavering@uark.edu
Sweeney, Sophia J., University of Arkansas

How do we know that?

Challenges, strategies and results of teaching preservice teachers one aspect of the nature of science, how science knowledge is created, will be discussed.

Weinburgh, Molly H., Texas Christian University m.weinburgh@tcu.edu
Smith, Kathy H., Texas Christian University

Silva, Cecilia, Texas Christian University
Oliver, Tammy, Texas Christian University
Gabel, Joanne, Fort Worth Independent School District

Is it a delta or data? Building academic language in science and mathematics for English Language Learners

We investigated the intersection of content and academic language acquisition in science and mathematics with nineteen elementary ELL students participating in a summer program.

Weinburgh, Molly H., Texas Christian University m.weinburgh@tcu.edu
Reynolds, Shrie, Texas Christian University
Sawey, April, Texas Christian University
Holden, Molly, Texas Christian University

If it is brown, it must dead: student data informing instructional decisions

Goethe's delicate empiricism informed instruction designed to enhance elementary preservice students' understanding of plants. We used action research to revise and improve the course.

Weiss, Tarin H., Westfield State College tweiss@wsc.ma.edu

“When does the Chihuahua go fastest?”: Urban Students’ Science Investigations ? What Do They Tell Us?

This study examined urban middle school students’ inquiry projects about mammals to explore student interest, mandated learning standards, and students’ life worlds.

Weld, Jeffrey D., Department of Biology jeff.weld@uni.edu
DelCarlo, Dawn, University of Northern Iowa
Ophus, John, University of Northern Iowa

Effects of a research experience for science teachers

Now in its second year, Project RAISE matches science teachers to university researchers for a troika’s benefit: updated teachers, enlightened faculty, and enlivened students.

Westerlund, Julie F., Texas State University jwesterlund@austin.rr.com
Lien, Violetta, Texas State University

Last Child in the Texas Woods: Future Science Teachers’ Childhood Nature Experiences

In this study, the childhood nature experiences of 50 future elementary teachers are examined through the use of science experience autobiographies.

White, Orvil L., The State University of New York at Cortland (SUNY Cortland)
whiteo@cortland.edu

Uncovering students lack of understanding of geological time and the experience (order) of life on the Earth.

Teachers' and students' lack of understanding of geological time and related concepts must be uncovered for learning to take place in geoscience at all levels.

Wild, Tiffany A., The Ohio State University
Paul, Peter, The Ohio State University

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Teachers' Beliefs Concerning Standards, Practices, Assessment, and Collaboration in Implementing Science Education for Students with Visual Impairments

This investigation examines the beliefs of teachers of students with visual impairments regarding standards, pedagogical practices, inclusion, assessment, and collaboration in implementing science education

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Science Museums & Specialized Content Courses for Prospective Elementary Teachers: Implications for Learning to Teach Science

This study explores opportunities to learn about science teaching in informal settings and how these complement prospective teachers' learning in a specialized content course.

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Unlocking Assessment Secrets: What are Preservice Teachers' Views of Assessment?

This study examines preservice teachers' recognition of different types of assessment, as well as their purposes, advantages, and disadvantages within a classroom setting.

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Textbook use in high school biology classes and student learning

This study investigates how the amount of time spent reading the text influences student learning in high school biology classes.

Young, Monica J., Syracuse University
Tillotson, John W., Syracuse University
Yager, Robert, University of Iowa
Penick, John, North Carolina State University
Holtz, Kevin, Syracuse University
Preczewski, Paul, Syracuse University
Glowacki, Julia, North Carolina State University
Maher, Terry, North Carolina State University
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Sadeghpour-Kramer, Margaret, University of Iowa
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Investigating the Meaningfulness of Preservice Programs Across the Continuum of Teaching (IMPPACT) in Science Education: Year One Results, Issues, and Reflections

IMPPACT, a 5-year study of preservice science teacher education, began in 2005. This symposium will discuss the current results, issues raised, reflections, and insights.

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If you build it, why will they come back? Motivation of teachers to re-enroll in a professional development project

This qualitative study explores factors motivating science teachers to continuously participate in an five-year extended professional development program.