10th Annual NSTA Global Conversations in Science Education Conference
(in collaboration with ICASE and CESI)

Sharing International Classroom Perspectives of Science: PreK–16

Hyatt Regency McCormick Place Hotel
Chicago, Illinois
March 11, 2015
REGENCY A

1:00–1:10 PM Welcome
Dr. Juliana Texley, 2014–2015 NSTA President, Michigan, USA
Dr. Teresa Kennedy, Cochair; NSTA International Advisory Board Chair and 2014–2017 ICASE President, Texas, USA
Dr. Michael Padilla, Cochair; 2005–2006 NSTA President, and ICASE North America Regional Representative, Georgia, USA

1:10–1:25 Global Conversations 10th Anniversary Opening Address
Developing a World View for Science Education: The Journey Continues
Speaker: Mr. Frank Owens, 2002–2008 NSTA Associate Executive Director for Programs and 1992–2002 NASA Director of Education, Florida, USA
Moderator: Dr. Teresa Kennedy

In celebration of the 10th anniversary of the NSTA Global Conversations in Science Education at the NSTA National Conference, Mr. Owens will reflect upon the rationale and past accomplishments of this significant effort and celebrate the richness that the international science education community has brought to the largest conversation of science educators in the world.

1:30–1:35 Remarks
Doug Young, Vice President, Missile Defense and Advanced Missions, Northrop Grumman Aerospace Systems

Northrop Grumman International Teacher Awardees
Ms. Diana Tomazos, Schools of Isolated and Distance Education, Australia
Ms. Kulvinder Kaur Johal, Northbury Primary School, United Kingdom

1:40–2:10 Global Conversations 10th Anniversary Featured Keynote Address
Perspectives From Eire (The Republic of Ireland): Curricular Designs Engaging the Practices of Inquiry
Speakers: Ms. Aine Hyland, Emeritus Professor of Education; Mr. Rory Geoghegan, Hon. Editor of SCIENCE, the official journal of the Irish Science Teachers’ Association; and Dr. Declan Kennedy, Senior Lecturer in Science Education, University College Cork, Ireland
Moderator: Dr. Michael Padilla
Research results on Syllabus Design, Inquiry-based Science Education (IBSE) Activities and the ICASE EU supported Profiles Project will be shared.

2:10–2:30 Round Table Discussion
Facilitators: International Council of Associations for Science Education (ICASE) executive committee members and Association of Presidential Awardees in Science Teaching (APAST) board members will be dispersed at tables to facilitate and record discussions.

Similarities and differences in programs around the world will be discussed. What is best practice in the design of curricula and creation of student performance expectations to help promote improved scientific literacy and increase motivation and enthusiasm for science learning?

2:30–2:35 Speaker Transition and Participant Break

2:35–3:05 Early Childhood and Elementary School Science Presentations (15 minutes each)
Moderator: Dr. Julie Thomas, Council for Elementary Science International (CESI) President, Nebraska, USA

Science Learning Starts Here! Importance of the Early Years
Speaker: Dr. Sue Dale Tunnicliffe, Commonwealth Association for Science, Technology and Mathematics Educators (CASTME), United Kingdom

Everyday experiences that preschool children undergo from their earliest years are critical in providing a firm foundation for science literacy development.

Co-Learning About Primary Science and Technology in China
Speaker: Dr. Guy Tranin, Associate Professor of Education, University of Nebraska, Lincoln, USA

TechEDGE is a collaborative project in China and the United States seeking to integrate mobile devices into elementary curricula. Lessons learned and “first-hand” knowledge of the process in science teaching and learning in less visited provinces will be shared.
3:05–3:25  Round Table Discussion
Facilitators: Ms. Kathy Horstmeyer, NSTA International Advisory Board Member and president of the Society of Elementary Presidential Awardees (SEPA), Connecticut, USA, with Council for Elementary Science International (CESI) executive committee members and Society of Elementary Presidential Awardees (SEPA) will be dispersed at tables to facilitate and record discussions.

Similarities and differences in programs around the world will be discussed. How do we ensure that science is taught well and viewed as an important subject in early childhood and elementary school?

3:25–3:30  Speaker Transition and Participant Break

3:30–4:00  Science Education and Technology in Upper Grades Presentation
Moderator: Dr. Bulent Cavas, ICASE president-elect and web communications, Turkey

Reactions in Motion: iPad Use to Increase Student Interest in Chemistry
Speaker: Ms. Martha Patricia Pérez Villegas, México

The presentation focuses on the outcomes of a successful pilot project at the Prepa UDEM using iPads in the chemistry classroom.

4:00–4:15  Poster Presentation Transition and Participant Break

4:15–5:15  Poster and Networking Session

5:20–5:30  Closing

6:00–7:00  President’s International Reception (Regency A/B)
Sponsored by ExxonMobil

NSTA is extremely grateful to ExxonMobil and Northrop Grumman Foundation for their generous support and contributions for this event.
OPENING ADDRESS
1:00–1:30 PM

Mr. Frank Owens, 2002–2008 NSTA Associate Executive Director for Programs and 1992–2002 NASA Director of Education, Florida, USA

*Developing a World View for Science Education: The Journey Continues*

In celebration of the 10th anniversary of the NSTA Global Conversations in Science Education at the NSTA national conference, Mr. Owens will reflect upon the rationale and past accomplishments of this significant effort and celebrate the richness that the international science education community has brought to the largest conversation of science educators in the world.

KEYNOTE ADDRESS
1:40–2:10 PM

Ms. Aine Hyland, Emeritus Professor of Education; Mr. Rory Geoghegan, Hon. Editor of SCIENCE, the journal of the Irish Science Teachers Association; and Dr. Declan Kennedy, Senior Lecturer in Science Education, University College Cork, Ireland

*Perspectives From Eire (The Republic of Ireland): Curricular Designs Engaging the Practices of Inquiry*

Research results on Syllabus Design, Inquiry-based Science Education (IBSE) Activities, and the ICASE EU supported Profiles Project will be shared.
PRESENTATIONS

2:35–3:05 PM

Early Childhood and Elementary School Science (15 minutes each)

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3:30–4:00 PM

Science Education and Technology in Upper Grades

Reactions in Motion: iPad Use to Increase Student Interest in Chemistry
Speaker: Ms. Martha Patricia Pérez Villegas, México

The presentation focuses on the outcomes of a successful pilot project at the Prepa UDEM utilizing iPads in the chemistry classroom.
ROUNDTABLE DISCUSSIONS

2:10–2:30 PM

Facilitators: International Council of Associations for Science Education (ICASE) executive committee members and Association of Presidential Awardees in Science Teaching (APAST) board members will be dispersed at tables to facilitate and record discussions.

“It is essential that all students have access to a high-quality science education that provides them with the skills and knowledge they need to be well-informed citizens, to be prepared for college and careers, and to understand and appreciate the scientific enterprise. The National Science Teachers Association (NSTA) recommends the adoption and implementation of the Next Generation Science Standards (NGSS; NGSS Lead States 2013) as an effective, research-based approach to accomplish these goals and transform science education.” NSTA position statement on the Next Generation Science Standards, 2013.

Similarities and differences in programs around the world will be discussed. What is best practice in the design of curricula and creation of student performance expectations to help promote IBSE and generate motivation and enthusiasm for science teaching and learning?

3:05–3:25 PM

Facilitators: Ms. Kathy Horstmeyer, NSTA International Advisory Board Member and President of the Society of Elementary Presidential Awardees (SEPA), Connecticut, USA, with Council for Elementary Science International (CESI) executive committee members and Society of Elementary Presidential Awardees (SEPA) will be dispersed at tables to facilitate and record discussions.

“The National Science Teachers Association supports the notion that inquiry science must be a basic in the daily curriculum of every elementary school student at every grade level. In the last decade, numerous reports have been published calling for reform in education. Each report has highlighted the importance of early experiences in science so that students develop problem-solving skills that empower them to participate in an increasingly scientific and technological world.” NSTA position statement on Elementary School Science, 2002

Similarities and differences in programs around the world will be discussed. How do we ensure that science is viewed as an important subject and that efforts are made to implement science as a basic component of early childhood and elementary school curricula and performance expectations?
**Computers, Coding, the NGSS, and Science Classrooms: Looking at Connections**

Michael Bowen (Mount Saint Vincent University, Halifax NS, Canada) and Anthony Bartley (Lakehead University, Thunder Bay, OT, Canada)

*Description:* This poster discusses the role that computer programming could serve in science classrooms to help address the NGSS by having students build their own probeware as well as demonstrating how countries such as England are addressing these issues through their use of the small and inexpensive computer called the “Raspberry Pi.”

**Enhancing Middle School Science Learning Through Exploration Curriculum and Service Learning**

Chih-Che Tai (East Tennessee State University, USA) and Mao-Cheng Lin (Guang Wu Junior High School, Taiwan)

*Description:* Learn about a project demonstrating a 10+ year practice of using exploration curriculum and service learning to advance middle school students’ interest in and achievement of science learning.

**Growing Music**

Kulvinder Kaur Johal (Northbury Primary School, UK)

*Description:* The project is about linking science and music. We grew bamboo in our school and then used it to create some pan pipes. We had to look at sounds, vibration, and pitch. We made our pan pipes and composed some music, which we performed at school.

**ICASE PROFILES Poster Series** (Profiles—Professional Reflection-Oriented Focus on Inquiry-Based Learning and Education Through Science—is currently one of the largest European FP7 funded projects in the field of “Science in Society.”)

**Introducing PROFILES Modules**

Jack Holbrook (University of Tartu, Estonia)

*Description:* This poster is an introduction to our special ICASE posters series illustrating aspects of the PROFILES project, such as teaching modules. It explains the use of a three-stage model to promote students’ intrinsic motivation using a socioscientific context-based approach, student-centered science learning in an inquiry-based approach, and the need to relate the science to society in a decision-making situation.
Inquiry-Based Science Education via the PROFILES Project
Declan Kennedy (University College Cork, Ireland)
Description: Promoting IBSE in the teaching of science at high school level via the PROFILES project: a collaboration between ICASE and University College Cork, national university of Ireland.

A PROFILES Project-Based Teaching and Learning Module
Bulent Cavas (Dokuz Eylul University, Turkey)
Description: This poster illustrates one STEM module describing how to create an ice cream car that runs on the beach using wind.

Optional Course Based on PROFILES
Miia Rannikmae (International Council of Associations for Science Education, Estonia)
Description: This poster illustrates modules developed for a grades 10–12 optional science, technology, and society course designed around a three-stage model.

Group Activities to Develop Inquiry Skills Through PROFILES
Rory Geoghegan (University College Cork, Ireland)
Description: Although these hour-long tasks may initially look easy, most of them are challenging and require integration of mathematics with designing and making small artifacts. The level of difficulty can be varied to suit the ability of the students.

Innovation Education: A Research Platform to Study the STEM Ecosystem
Michael R. L. Odell (University of Texas at Tyler, USA)
Description: UT Tyler is working within an interdependent and interrelated organizational ecosystem that requires access to critical data, a favorable policy environment, and the sharing of best practices. Our model STEM ecosystem for educational research aims to reduce educational disparities and improve outcomes for all students. Results from the 2012–2015 implementation period will be shared.

Innovative Science Teaching in Japan: Transformative Science Learning Through Teaching Abroad and Web-Based Professional Development
Manabu Sumida (Ehime University, Japan)
Description: Japan’s history has a record of a period of national isolation for over 200 years. The effect of this social situation has become evident in the Japanese education system; it is very difficult to meet with non-Japanese teachers. In the 21st century, Japan’s educational system has been struggling to deal with the impact of internationalization in and out of schools. In this presentation, two innovative studies on transformative science learning are introduced. First, Ehime University has conducted a “Teaching Abroad Program” in cooperation with the University of the Philippines. It is imperative to develop a training programme that can enable Japanese teachers to teach science in heterogeneous educational settings in different cultures and languages. Second, a web-based collaborative lesson study system was developed. This system enabled educators to (1) watch educational practices and leave comments; (2) conduct real-time discussion; and (3) reflect on and analyze the database of comments.
Japanese Lower Secondary Science Lessons After TIMSS 1999 Video Study
Shuichi Yamashita (Chiba University, Japan)
Description: The TIMSS 2011 and PISA 2012 results in Science revealed that
the Japanese students have the highest average achievement, even though they
allot less time for science classes (165 minutes per week, the OECD average
is 200 minutes per week). In spite of Japanese students excellent performance,
how teachers conduct the lesson is still a mystery to many foreigners. This poster
session examines Japanese science lessons in terms of lesson structures,
practical works, board works, and development of teaching materials.

Mission X: Train Like an Astronaut
Kulvinder Kaur Johal (Northbury Primary School, UK)
Description: We are trying to improve our stamina, core strength, agility, and
health awareness by training like an astronaut. Pupils are learning about reaction
times, fluid intake, and the healthy plate as they train like an astronaut.

Ocean for Life
Tracy Hajduk (NOAA Office of National Marine Sanctuaries, Maryland), Claire
Fackler (NOAA Office of National Marine Sanctuaries, California), Marlies Tumolo
(NOAA Office of National Marine Sanctuaries, Maryland), Rafat Jambi (Saudi
Arabia), and Teresa Kennedy (ICASE and The University of Texas at Tyler)
Description: Ocean for Life is a program for multicultural teens to discover marine
science, conservation, stewardship, cultural understanding within the context of
how the ocean connects us all. A total of 115 students from 17 countries are now
Ocean for Life alumni and considered ambassadors of change. Learn about the
profound impacts of this unique program at this poster session.

Overcoming Anti-Science Biases Among International Students in the
Caribbean Region Through Evidence-Based Instruction
Anthony Husemann (International College of the Cayman Islands)
Description: Students in a small international college in the Caribbean were
polled as to their knowledge of and attitudes toward some basic scientific
concepts. The results indicate a need to clearly demonstrate the evidence for,
among others, Big Bang Cosmology and Biological Evolution.

Phenomenon-Based Learning: Engaging, Authentic, and Fun!
Mikko Korhonen (Mikkelin Lukio, Finland), Jukka Kohtamäki (Hakkari School,
Lempaala, Finland), and Matt Bobrowsky (College of Mathematics, Natural
Sciences, and Technology, Delaware State University, Delaware, USA)
Description: Phenomenon-based learning (PBL) builds knowledge of—and
interest in—physics as a result of observations of real-world phenomena, in
this case, some fun gizmos. Why PBL? PISA assessments showed that Finnish
students were among the top in science proficiency. PBL combines elements
of what's done in Finland with what's known from science education research
to present science in ways that are both fun and educational. The approach
includes elements of progressive inquiry, problem-based learning, collaborative
learning, responsive teaching, and hands-on experiments. The idea is to teach
broader concepts and useful thinking and performance skills (as with NGSS)
rather than asking students to simply memorize facts and formulas. Students
investigate an interesting gadget or gizmo and, motivated by their own curiosity, explore and discover how it works and what physical phenomena are involved. Thus the PBL approach to learning is based on curiosity and creativity—a fun way to learn!

**Picture This! Scientists and Science Teachers Around the Globe**
Julie Thomas (University of Nebraska, Lincoln, USA)
*Description:* This poster organizes “Draw a Scientist” and “Draw a Science Teacher” images from different countries around the world and to explore the similarities and differences.

**Reactions in Motion: iPad Use to Increase Student Interest in Chemistry**
Martha Perez (Universidad de Monterrey, Mexico)
*Description:* This poster focuses on the outcomes of a successful pilot project at Universidad de Monterrey in Mexico that used iPads in the chemistry classroom.

**Safety in Science**
Sandra West (Texas State University, USA)
*Description:* This poster session reviews findings from a longitudinal (1990–2007) study of safety in Texas secondary science classrooms that identifies factors such as overcrowding that link with increased accident rates.

**STEM in Western Australia**
Diana Tomazos (Science Teacher’s Association of Western Australia, Schools of Isolated and Distance Education)
*Description:* STEM in Schools of Isolated and Distance Education: This poster describes different programs underway: online delivery of courses through using the Moodle platform and lessons conducted by SABA web conferencing to enable students to achieve WACE qualifications and allow equity for students who would otherwise not have access to the curriculum courses; the Schools Pathways Program to enhance sustainable school-based education and training pathways (VET or academic) to higher education or the workforce and working with schools to bring 21st century learning into the classroom; the use of robotics and data loggers to engage students has been a success; the Einsteinian Physics Project to deliver hands-on lessons to enhance learning Einsteinian physics; a UWA initiative involving the collaboration and networking with physics teachers to share ideas on how to deliver higher order concepts to middle school students; and Spice and ATSE STELR resources and programs available to Science Teachers in Western Australia.

**Student Water Initiative in Michigan: Place-Based Learning on the Lakes for Urban Youth**
June Teisan (Network of Michigan Educators, Washington, DC, USA)
*Description:* How do we cultivate environmental stewardship for urban youth who have little to no exposure to nature? Learn how one educator with zero dollars in her classroom budget built an award-winning, place-based student STEM research program for middle school student-scientists in metro-Detroit. The ‘SWiIM’ Team—Student Water Initiative in Michigan—sailed the lakes, built data buoys and deployed them in shallow wetland areas, explored the rich biodiversity
of shorelines, and submitted their research to national science competitions, winning prizes and opening doors to future careers in the STEM fields.

**The Professor Within the Machine: How to Teach and Learn Globally**
Oliver Grundmann (University of Florida, USA)
*Description:* Online science courses in higher education are on the rise. This poster summarizes the current trends in distance technology and teaching related to science.

**Using Concept Mapping in Science Classrooms**
Priit Reiska (Tallinn University, Estonia) and Alberto Canas (Institute for Human and Machine Cognition, Florida, USA)
*Description:* To achieve today's goals in science education, new innovative methods such as concept mapping are needed. We introduce theory and give useful examples of concept mapping.

**What Is Zoo Education?**
Sue Dale Tunnicliffe (University College, London Institute of Education, UK)
*Description:* Join us for a discussion on the many educational offerings at zoos, especially the development of biological literacy.

**Will the Chunks Be Broken Down to Be Swallowed So Choking Doesn’t Result?**
Lindiwe Tsabedze (Swazi National High School, Swaziland)
*Description:* Curriculum designers in Swaziland explore challenges faced by learners on the acquisition of the science content. Preliminary findings indicate some difficulties in handling higher order questions, a transition gap from junior secondary level to senior secondary level, and issues with teachers not being trained to diagnose and assist learners with special needs.
International Council of Associations for Science Education
Representatives
Dr. Teresa Kennedy, President (2014–2017) and NSTA International Advisory Board Chair
Dr. Bulent Cavas, President-Elect (2014–2017)
Dr. Ben Akpan, Immediate Past President (2011–2014)
Dr. Declan Kennedy, World Headquarters Coordinator
Dr. Jack Holbrook, Past President (2008–2011) and International Projects Chair, Estonia
Dr. Michael Padilla, North America Regional Representative
Dr. Miia Rannikmae, University Liaison, Estonia
Dr. Sue Dale Tunnicliffe, European Regional Representative
Dr. Mamman Wasugu, Africa Regional Representative www.icaseonline.net

Council for Elementary Science International (CESI) Representatives
Dr. Julie Thomas, Nebraska, USA; President, CESI www.cesiscience.org
Ms. Susana Ramirez, Texas, USA
Ms. Jeanelle Day, Connecticut, USA

Presidential Awardees in Science Teaching
Ms. Kathleen Horstmeyer, Connecticut, USA; President, Society of Elementary Presidential Awardees (SEPA) http://sepamembers.weebly.com
Mr. Fred Myers, Connecticut, USA, President, Association of Presidential Awardees in Science Teaching (APAST) www.apast.org

Presidential Awardees in Science Teaching Representatives:
Ms. Cathy Barthelemy, Texas, USA (SEPA)
Ms. Alma Miller, Washington, DC, USA (SEPA and APAST)
Ms. Kathy Renfrew, Vermont, USA (APAST)
Mr. Dwight Sieggreen, Michigan, USA (APAST)
Ms. Catherine Valentino, Rhode Island, USA (SEPA)
* NSTA International Lounge

Please stop by the NSTA International Lounge in the Michigan Room. The lounge may be used as a place to relax or as a meeting place while you’re here at the Chicago conference.

**Hours:**
- Thursday, March 12: 9:00 AM – 5:00 PM
- Friday, March 13: 9:00 AM – 5:00 PM
- Saturday, March 14: 9:00 AM – 5:00 PM

*NSTA is extremely grateful to ExxonMobil and Northrop Grumman Foundation for their generous support and contributions for this event.*