International Council of Associations for Science Education

Supporting and promoting science education internationally
The ICASE Newsletter

DECEMBER 2014 - JANUARY 2015

Welcome to the ICASE December 2014 - January 2015 Newsletter!

The ICASE Newsletter is a publication containing current information about ICASE and topics of interest in the field of science education. The table of contents for this issue is located in the right hand column.

The International Council of Associations for Science Education (ICASE) was created in 1972 by the United Nations Educational, Scientific and Cultural Organization (UNESCO) to extend and improve science education throughout the world. Today, ICASE is a vast network of science teacher education associations, institutions, foundations and companies, working together to promote science and technology education around the world. ICASE facilitates communication and cooperation at national, regional, and international levels. The ICASE Strategic Plan (2013-2023) calls for ICASE to adopt a position of Excellence and Leadership in Science Education.

http://www.icaseonline.net

Over the past 40+ years, over 200 organizations have been members of ICASE. Currently, there are 53 organizations from 27 countries contributing to the financial administration of ICASE.
www.icaseonline.net/membership.html

The ICASE Newsletter is distributed to Member Organisations and through them to their members

To be included on the listserve for notification of future newsletters please follow the guidelines at:
www.icaseonline.net/news.html

Read or Submit a Manuscript to the ICASE Journal:

Science Education International

For information please visit our Journal web page:
http://www.icaseonline.net/seiweb

Contents of Newsletter

Editorial:
Jack Holbrook
ICASE Publications Committee
jack@ut.ee

Assisted by:
Bulent Cavas
Teresa Kennedy

ICASE News

ICASE-RISE Workshop
From 7-11 November 2014, ICASE held a workshop in Guilin, P.R. China, in conjunction with the **RISE** (**R**esearch **I**n **S**cience **E**ducation) Centre of Guangzi Normal University introducing the concept of new style teaching modules to promote Scientific and Technological Literacy guiding participants to develop their own teaching materials based on **SMILES** - **S**tudent **M**otivational, **I**nquiry-based **L**earning driving **E**ducation through **S**cience. For more information, see page 3.

PROFILES Conference
ICASE, as a member of the **PROFILES** (**P**rofessional **R**eflection-**O**riented **F**ocus on **I**nquiry-based **L**earning and **E**ducation through **S**cience) project consortium, participated in the 2nd and final **PROFILES** conference, held in Berlin, Germany on 23-26 August 2014. The project has been extended for 6 months to ensure ICASE can continue dissemination. For more information, see page 6.

ENGINEER Project
The 3-year **ENGINEER** (br**E**aking **N**ew **G**round **IN** the **S**cienc**E** **E**ducation **R**ealm**)** project (2011-2014) has now successfully come to an end. ICASE was a member of the 10 European country consortium. Outcomes from the project are described on page 8, along with additional efforts to further disseminate **ENGINEER** Project materials in Africa and Latin America on page 15.

Safety in Science Education
The ICASE Committee for Safety in Science Education is seeking a representative from each ICASE member organization to serve on the committee. If you or someone you know would be interested in serving as your organization's representative, please contact the committee chair at jim@labsafetyinstitute.org. See page 16 for a conversation about safety considerations for food and drink in the science classroom/lab.

Science Education International – the ICASE journal
This ICASE quarterly, open access, online journal, is now entering its 26th year. Volume 25 of the journal included 2 special issues and articles from around the world in issues 3 and 4. For more details and information about the journal including how to submit articles please see page 18 or visit the ICASE website at www.icaseonline.net/seiweb.

ICASE Members Networking Around the World
From UNESCO conferences in Asia, to UIA Roundtables in Europe and hightlights from one of the prestigious Keynote Speakers at the ICASE WorldSTE 2013 Conference in Kuching, Malaysia, ICASE networking occurs around the world, see page 22 for more information.

ICASE and international conferences
ICASE members participate in science education events around the world. See highlights from ASE on page 23 as well as information on future events, displays and presentations at NSTA, ISTA and IOSTE on page 24.

ICASE Executive Committee
The current ICASE Executive Committee is listed on page 27.

THE ICASE-RISE Workshop, Guilin, P.R.China

The main objective of the workshop was related to "Motivation through Relevant Context-based situations driving Student-centred Inquiry-based Science Education while recognising the need for enhancing educational competences" and is a development of past ICASE workshops promoting Scientific and Technogical Literacy.

Under the auspices of the ICASE Science and Technology Education Centres Standing Committee, chaired by Dr. Janchai Yingprayoon (front row; 4th from right) and the ICASE projects committee, chaired by Dr. Jack Holbrook (front row; 4th from left), a 4-day workshop was held in conjuction with the RISE (Research in Science Education) Centre in Guangzi Normal University under the leadership of Prof. Luo Xingkai (front row; 3rd from right). Participants were from different regions of China and Thailand.

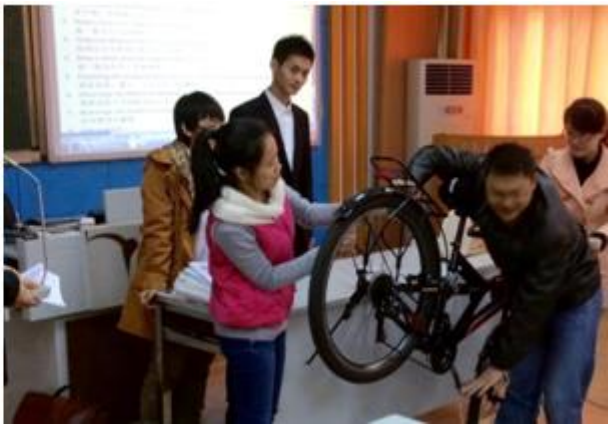
The goals of the workshop were to:

(a) introduce a new philosophical approach to the teaching of science;
(b) interrelate science education and technology (engineering) education and promote interdisciplinary science;
(c) incorporate competence development and 21st century skills into classroom teaching; and
(d) create meaningful teaching materials based on a 3-stage model for dissemination throughout the ICASE international network.

THE ICASE-RISE Workshop, Guilin, P.R.China, cont.

Once the philosophical ideas had been introduced, participants, in groups, set about creating teaching modules, based on 3 stages. The first important stage was an intrinsically motivational scenario (which also served as obtaining students' prior science learning); the second, inquiry-based science learning which includes engineering planning and creating; and a third stage, consolidation of the science learning, incorporated science in socio-scientific decision-making.

Introducing a challenge: How to get the ball out of the tube without moving the tube?



Going faster – easier: Exploring mechanical advantage using gears.

As the initial stage, participants made plans to create an interesting scenario, which was both relevant and motivational for students (the grade level chosen was grades 7-9). While the scenario could be developed as a challenge, participants worked to make this relevant to students (thus trying to overcome the problem of science teaching being not meaningful to the lives of students).

A major rationale for the scenario was to determine students' prior knowledge related to the scientific conceptual topic to be taught (e.g. density and floating/sinking in the left-hand photo as well as levers, pulleys and gears in the second photo above).

A key element introduced was a student-centred approach, especially related to scientific thinking both with respect to conceptual learning and scientific process skills. Where experimentation involved new equipment, students were engaged in the challenge of engineering design and planning.

The ultimate target was that the science ideas gained could be interrelated with concerns or issues in society and resulting that science was seen as an important learning area for developing responsible citizens and making viable career choices.

THE ICASE-RISE Workshop, Guilin, P.R.China, cont.

Besides the focus on creating modules, participants also reflected on making the teaching interesting.

Communication was seen as an important skill associated with the learning of science and this went beyond the development of oral and written skills to also relate it to instructional technology, including developing novel ways to present science ideas. Thanks go to Professor Luo Xingkai for agreeing to host this workshop and to all those behind the scenes ensuring that this workshop a success. Special thanks go to the gallent interpreters, without whom the workshop would have been a non-starter.

Discussions on inquiry-based science components of the module and group presentations.

PROFILES Project Conference in Berlin

From 23-26 August 2014, the PROFILES project consortium team members and invited guests from other European projects gathered in Berln, Germany, for the 2nd and final conference for the PROFILES project. The ICASE representatives involved included:

Dr. Jack Holbrook, serving as the leader of the steering committee, jointly handling PROFILES dissemination, coordinating ICASE involvement and representing the legal entity for ICASE, and also coordinating the involvement of a teacher group from Nantes, France (ICASE-MICE);

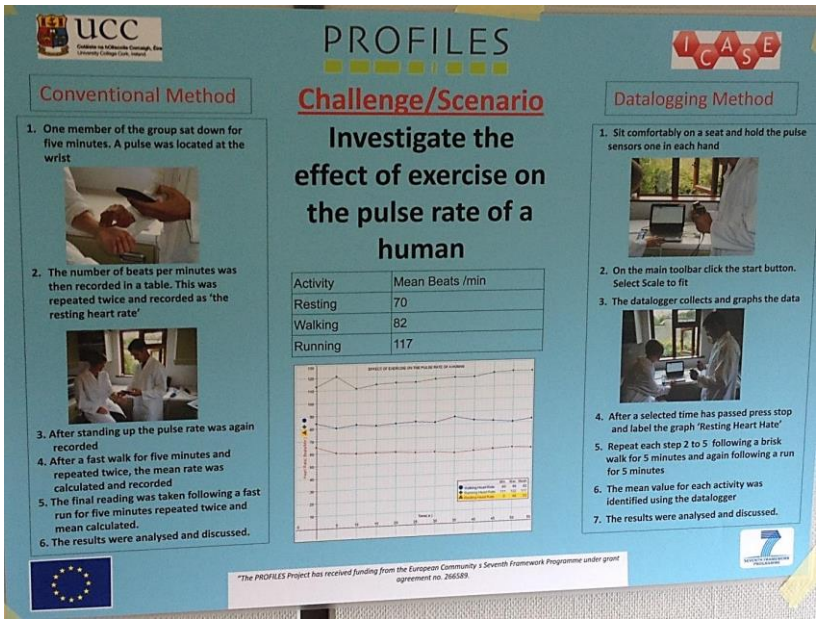
Dr. Bulent Cavas, facilitating ICASE involvement in Turkey as well as representing the Dokuz Eylul University from Ismir, Turkey.

Dr. Declan Kennedy, facilitating ICASE involvement in Ireland as well as representing the UCC-University College, Cork Ireland; and

Dr. Miia Rannikmae, serving on the PROFILES steering committee as the leader for workpackage 2 (support and cooperation) and workpackage 4 (teaching environment or more expliciaty in the development of teaching modules), as well as representing the University of Tartu, Estonia.

Also participating under ICASE auspices were a group of teachers from Nantes, France. These teachers, calling themselves ICASE-MICE (Motivational Inquiry Science Education) experimented with PROFILES ideas while teaching science to secondary students in a language other than the students' mother tongue. Usually this was undertaken in English and a published article describing this appeared in the 2nd PROFILES book (see the PROFILES website at www.profiles-project.eu under dissemination).

Within the conference, Dr. Declan Kennedy conducted an ICASE-UCC workshop on developments in Ireland. The poster below illustrated materials displayed and described challenges within the scenario.



PROFILES Project Conference in Berlin, cont.

Dr. Declan Kennedy provided an inspiring introduction to the workshop which was well-attended by other consortium partners.

Dr. Bulent Cavas organized another well-attended workshop using Lego blocks.

This workshop, strongly correlated to the PROFILES Project, led to a decision making activity, designed to consolidate learning about design and technology, using mechanisms – gearing down, assembling components, combining materials, renewable energy, measuring area, measuring distance, measuring time, forces, friction, air resistance, pressure, scientific investigation, taking examples from everyday life, and introducing friction, energy and power.

ENGINEERING in Science Education

For the last 3 years ICASE has been involved as a member of the ENGINEER European project in which museum partners developed, piloted and involved teachers in using Engineer modules for primary schools (grades 4-7). Besides the modules covering 4 lessons, the partners developed teacher guides which can be viewed on the project website at www.engineer-project.eu.

Introducing Engineering into Science Education

The 3-year EU project "brEaking New Ground IN the SciencE Education Realm" operated from 2011-2014. ICASE was a partner with other partners from Czech Republic, Belgium, France, Germany, Greece, Israel, Italy, Netherlands, Sweden and the UK. The website illustrating the work of the project, contains all details including the teacher's guide.

Rationale
In a context, or science-in-society focus for science education, science is often inseparable from technology. And whereas we usually think of technology as a useful product, science is extremely likely to be behind the process involved in making this useful product. Today the teaching of science subjects can be expected to interrelate with the technology.

An engineer is a person involved in the creative process of making a technological product. As it is a creative process, engineering involves a number of process sub-components. Examples of these, expressed in the European project ENGINEER (see www.engineer-project.eu) include:

Ask, Imagine, Plan, Create, Improve

- The ask part is to identify (ask about) a problem that needs to be solved, thus providing a challenge. The solution in this case involves creating a technological product;
- The imagine component is to put forward ideas (imagine ways) for solving the problem;
- The plan is to offer an idea, opinion or reason to develop a product that will solve the problem;
- Create includes making the technological product; and
- Improve involves evaluating the suitability of the product for solving the problem, noting that factors unrelated to science may need to be considered, e.g. cost, environmental concerns.

Evaluation conducted on incorporating engineering in science teaching, using inquiry-based pedagogic methods within the ENGINEER project, have shown to have highly desirable impacts on students and teachers, increasing student interest in science and engineering. On the next page, 10 engineering design challenge units are outlined, suited to European environments and developed within the ENGINEER project using an Engineering Design Approach to the learning of science. Each unit focuses on one engineering field and uses inexpensive materials for student-led design problem-solving.

ENGINEERING in Science Education, Cont.

The Engineering in science education challenges are:

1. Popular mechanics: Becoming a designer of machines
2. Suck it up: Designing a contraption that sucks up debris
3. Music to the ears: Designing and creating a sound generator
4. Huff and puff: Designing a device for measuring exhalation volume
5. Life support: Direct water flow to plants
6. High flyers: Building a glider with everyday materials
7. High and dry: Protecting objects on a floating platform
8. Frisky feet: Winter-proof a pair of shoes
9. Knee deep: Designing and constructing a water pond
10. A fine balance: Building a hanging sculpture

A short introduction to each challenge

1. Popular mechanics: Becoming a designer of machines
This unit is designed for 9 to 11 year old students and relates to the science curriculum on Mechanics with a focus on transmission and transformation motion. Students discover mechanical devices and conceive and create a mechanical toy (for younger students) or a calculating machine (older participants).

The teacher guide presents

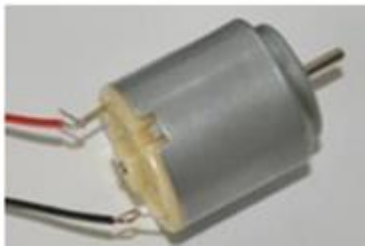
- the story to set the context
- worksheets for students
- the content of the activities

ENGINEERING in Science Education, Cont.

2. Suck it up: Designing a contraption that sucks up debris

This unit is designed for 11 to 12 year old students. It relates to the science curriculum on Electricity with a focus on electric circuits, motors and batteries. Students discover how a hairdryer works and then work with batteries, motors and fans to design and construct their own small vacuum cleaner.



3. Music to the Ears: Designing & Creating a Sound Generator

This unit is designed for 9 to 11 year old students. By participating in the challenge 'Make a soundtrack for a silent movie with your own designed sound box' the students learn about sound and acoustics.




ENGINEERING in Science Education, Cont.

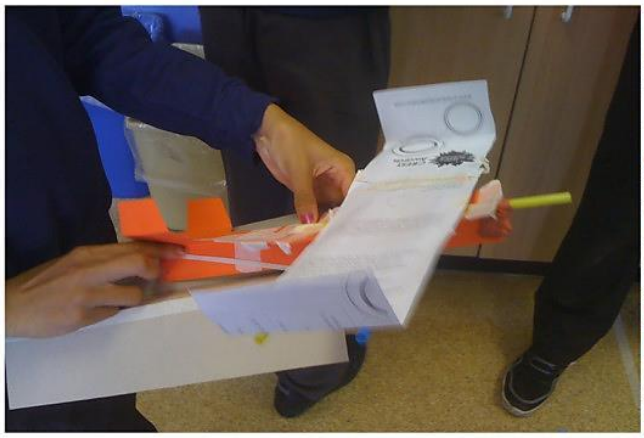
4. Huff & Puff: Designing a device to measure Exhalation Volume
This unit is designed for 10 to 12 year old students and relates to the science curriculum for the respiratory system and the concept of volume, as well as the biomedical engineering field.

By participating in the challenge 'Ready Steady Blow" the students will learn about the respiratory system, the concept of volume, principals of measurement, and different methods to measure volume. They will experience the Engineering Design Process (EDP) by designing a biomedical instrument for measuring the volume of air that can be expelled from their lungs after a deep inhalation (maximal exhalation volume).

5. Life Support: Direct Water Flow to Plants
This unit is designed for 9 to 10 year old children and relates to the science curriculum on plants with a focus on the transport of water. Students undertake experiments to discover how plants transport water from the ground to the top of the plant and how people use materials from plants to soak up water. Finally students build their own water-aquaduct system.

ENGINEERING in Science Education, Cont.

6. High Flyers: Building a Glider with everyday materials
This unit is designed for 9 to 12 year old students. In this unit, students learn about flight and aeronautical engineering. Over the course of four sessions they discover more about the properties of materials, the forces involved in flight, as well as have the chance to build, test and evaluate their own gliders.



How would you build a glider capable of carrying messages and gifts between children living in two houses 3m apart? In this unit, students are challenged to find out the answer.

7. High and Dry: Protecting objects on a Floating Platform
This unit is designed for 9 to 11 year old students to encourage tackling the challenge "Design your own floating platform" learn about floating and sinking, and ocean engineering. In this unit, students observe and describe how different objects behave when placed in water.

Following the five steps of science investigation, they discover critical factors which determine whether an object will sink or float. Finally, they apply the Engineering Designing Process in order to design and build a floating platform.

ENGINEERING in Science Education, Cont.

8. Frisky Feet: Winter-proof a pair of Shoes
This unit is designed for 9 to 12 year old students. In the challenge "Engineering on insulation – Designing insulating shoe soles" the students will learn about insulation and be introduced to the field of Building Engineering and Materials Research. They will also design and create their own insulating shoe sole.

9. Knee Deep: Designing and constructing a Water Pond
This unit is designed for 9 to 12 year old students focusing on a large shopping center that will be built in place of a park containing beautiful pond frogs and other animals. To save the frogs, why not build a pond for them in the school garden? Starting from this story the teacher introduces students to an engineering problem. The practical aim of the unit is to design and to make a model of a pond. At the end students reflect on how to create a real pond. The students explore what are the main features of a pond. They investigate through experiments the composition the soil is composed of and how different materials react when in contact with water. Then students, working in groups, choose an appropriate waterproof material to build the bottom of the pond, following the engineering process (ask, imagine, plan, create, improve).

ENGINEERING in Science Education, Cont.

10. A Fine Balance: Building a Hanging Sculpture

This unit is designed for 9 to 12 year old students. By participating in the challenge 'building a mobile' the students learn about mechanical engineering a working environment and the physical concepts of balance and force. While building their mobile, students gain the experience of working like an engineer constructing cranes.

The lessons show that engineers work together with different professionals. In the introductory scenario the class is confronted with an artist who needs help to build a hanging balanced sculpture in the entrance hall of their school. He has difficulties with obtaining a good balance and asks a mother of one of the children who is an engineer for help. Artist and students together learn about balance and forces.

ENGINEERING in Science Education, Cont.

ENGINEER Project dissemination in Latin America: Argentina

ICASE President, Dr. Teresa Kennedy, spent the month of October 2014 in Argentina creating an engineering education course in line with the Ministry of Science, Technology and Innovation's national plan—Argentina Innovadora 2020—for use at the National University of Comahue (Uncoma) in Neuquén and sharing information with professors and educators in Argentina about the ICASE ENGINEER Project. Her efforts were funded by the U.S. Fulbright Specialist Program.

The Engineering Education course focused on project-based learning to provide opportunities for students to engage in real-world problem solving and address core content through rigorous, relevant, hands-on learning, and highlighted projects created through ENGINEER. She worked with over 50 professors, administrators, teachers and students in university and K-12 environments, assessed academic curricula and educational materials currently in use in the Masters/Doctoral engineering program at Uncoma, and participated in teacher-training programs at the university and local schools.

ENGINEER Project dissemination in Africa: Uganda

The ICASE ENGINEER Project was also the focus of discussion at the recent **Science Day for Girls** held on 6 December 2014 by ICASE member organization the **Women and Girls Can Initiative (WaGCI)** in Masaka, Uganda. Dr. Teresa Kennedy, ICASE President, provided a Keynote Address for the Science Day and STEM Laboratory Ground Breaking Ceremony entitled **STEM: The Practical Way Forward to Bridge the Gap Between Science and Girls.** During the event, partcipants discussed how to infuse hands-on science into their daily lessons through project-based engineering activities. In addition, a presentation on **Promoting Equity in STEM Education** was shared by Dr. Teresa Kennedy together with representatives from the Science Teachers Association of Nigeria (STAN) Dr. Theresa Ekanem and Mrs. Aniekan Udongwo from Akwa Ibom State College of Education in Afaha Nsit, Nigeria.

ICASE Committee on Safety in Science Education

James A. Kaufman, Ph.D.
President/CEO, The Laboratory Safety Institute (LSI)

Chair, ICASE Committee on Safety in Science Education
www.icaseonline.net

A Conversation about Food and Drink in the Science Classroom/Lab

A science teacher contacted me recently with a question about eating and drinking in school science classrooms and laboratories. The ICASE Committee on Safety in Science Education would like to share this conversation with our Newsletter readers.

Here's the original question:
Hi Jim,
I have a lab safety question for you that just landed on my desk. As I told you in a previous email, I now teach life science and Environmental Science. We have a number of sinks in the lab. I use no hazardous chemicals in my lab, except for dissection materials, but the kids do grow organic veggies in a school garden and we enjoy the fruits of our labor.

I have therefore used one side of the room (sinks) for washing the vegetables, washing dishes that I use at lunch and water I use to make my coffee. On the other side of the room I have the sinks set aside for the last week of school when we do dissections. All sinks are cleaned by the custodial staff daily. No other teachers use my room, nor have any other teachers ever used my room as the school is only 2 years old.

What do you think? Safe practice?
If not, how would you go about dealing with my situation of having some classes growing and eating food as part of the curriculum.

I responded:

This is always a tough call. It depends on how rigorous you want to be. Here's the US regulation.

1910.141(g)(1) on Application. This paragraph shall apply only where employees are permitted to consume food or beverages, or both, on the premises.

1910.141(g)(2) on Eating and drinking areas. No employee shall be allowed to consume food or beverages in a toilet room, nor in any area exposed to a toxic material.

1910.141(g)(4) on Sanitary storage. No food or beverages shall be stored in toilet rooms or in an area exposed to a toxic material.

ICASE Committee on Safety in Science Education, Cont.

So, the employer must decide whether the food or beverage is in an area exposed to a toxic material. Specimen preservatives and the formaldehyde (methanal) used to infuse them are toxic. We probably agree about that.

How about that in the last two weeks of school your remove all the food, beverages, edible plants, etc. and use it as a lesson to teach about the sanitation regulation and best practices in laboratories?

The teacher wrote back:
Hi Jim, thanks for that.

I am reading that it is the area which is exposed to toxic materials that is an issue, not that it is a lab area per se. Correct?

We don't actually use any hazardous materials (dissections) until the last 2 weeks of school. Plus I use formaldehyde (methanol) free specimens; but still, wouldn't want to wash vegetables in the same sink.

So I will say that the "area" on one side of the lab is fine, and the "area" on the other side of the lab is reserved for washing the specimen trays. And to be safe, I will also not allow any washing of vegetables while we are dissecting, since it is only for a week or two.

I replied:

Unfortunately, molecules of toxic material do not know that they should stay on one side of a room.

Our common experience teaches us that. If we open the front door going to dinner at a friend's house, we know immediately that they have been baking bread, or making an apple pie. Those 'yummy' bread/pie molecules are everywhere in the house. They cannot be simply asked to stay in the kitchen.

The same is true for toxic molecules. Unless there is a very good ventilation system to control air flow, the vapors fill and are absorbed throughout the room. That's why we use chemical fume hoods.

Then, there is the separate, but related, issue of transfer by touching.

So, my feeling is that it would be neither proper hygiene nor proper role modeling for students to draw an imaginary, or real, line on the floor saying: here toxic, there non-toxic. ...
Jim

One final thought:

The bottom line: food or beverage (for consumption) in the science classroom is a bad idea, poor practice, and inappropriate role modeling.

ICASE Journal - Science Education International

The ICASE quarterly journal is now about to enter its 26th year. From humble beginnings in 1990 when it was created to serve as the major dissemination channel for ICASE, the journal has now grown to be a major English language international science education journal, receiving articles from science educators around the world. Thanks to its team of volunteers, the journal follows a strict review process to ensure the research and philosophical articles meet the ICASE criteria as relating to primary or secondary science education or to pre-service teacher education at the tertiary level. Since 2008, the journal is available online only, although limited copies of occasional issues are published and distributed to interested science educators.

THE ICASE JOURNAL IS A MAJOR DISSEMINATION CHANNEL FOR ICASE MEMBER ORGANISATIONS AND THEIR MEMBERS. AS SUCH, ICASE GIVES PRIORITY TO ARTICLES SUBMITTED VIA ICASE MEMBER ORGANISATIONS AND IS VERY WILLING TO ASSIST MEMBER ORGANISATIONS IN PREPARING ARTICLES FOR THE JOURNAL.

A major attraction of SEI is that there is no payment for those wishing to publish in the journal. And ICASE welcomes submissions by teachers, higher degree students or science educators in general from around the world. ICASE will do its best to assist authors whose native language is not English.

Before making a submission, please consult the Author's Manual for SEI located at www.icaseonline.net/seiweb for information related to the following topics:

(a) Copyright (b) Plagiarism
(c) Language (d) Material submission
(e) Formatting (f) Artwork & Photos
(g) The Review Process (h) Non-native English authors

And we very much appreciate referencing articles previously published in SEI in your submissions.

ICASE continues to explore ways of including SEI in well known international databases (we welcome suggestions from perspective authors). At present SEI is listed in the following databases:

ERIC (Education Resources Information Center)
The Asian Education Index
Education Research Complete Database
Index Copernicus Journals Master List
DOAJ Directory of Open Access Journals
The Education Research Global Observatory

ICASE also welcomes new reviewers. If you are interested please contact Dr. Baohui Zhang, Chair, ICASE Research and Publications Standing Committee at baohui.zhang@snnu.edu.cn.

The titles of the articles in the 4 issues for 2014 are given on the next page. Please refer to www.icaseonline.net/seiweb for the full articles.

Volume 25 Issue 1 (Short articles)

1. Active and Peer Learning in STEM Education Strategy
2. IBSE and Creativity Development
3. IBSE and Gifted Students
4. Raising Standards through INQUIRE in Pre-Service Teacher Education
5. Balancing the Needs between Training for Future Scientists and Broader Societal Needs- SECURE Project Research on Mathematics, Science and Technology Curricula and Their Implementation
6. First-Year Students' Priorities and Choices in STEM Studies—IRIS Findings from Germany and Austria
7. Intensifying Innovation Adoption in Educational Health
8. Preparing Elementary and Secondary Pre-Service Teachers for Everyday Science
9. Science Camps in Europe—Collaboration with Companies and School, Implications and Results on Scientific Literacy
10. Environmental Education through Inquiry and Technology
11. Beyond Nature of Science: The Case for Reconceptualising 'Science' for Science Education
12. Assessment of Inquiry Skills in the SAILS Project
13. Does Artificial Tutoring Foster Inquiry-Based Learning?

Volume 25 Issue 2 (Special Issue on the PROFILES project)

1. Identifying teacher needs for promoting Education through Science as a paradigm shift in Science Education
2. Finnish Science Teachers' Views on the Three Stage Model
3. Developing in-service science teachers' ownership of the PROFILES pedagogical framework through a technology-supported participatory design approach to professional development
4. The PROFILES Project Promoting Science Teaching in a Foreign Language
5. PROFILES Networks: Three International Examples

Volume 25 Issue 3

1. Engaging Students in STEM Education
2. Neighbourhood Analysis to Foster Meaningful Learning Using Concept Mapping in Science Education
3. Influence of Computer-Assisted Roundhouse Diagrams on High School 9th Grade Students' Understanding the Subjects of 'Force and Motion'
4. An Evaluation of the Pattern between Students' Motivation, Learning Strategies and Their Epistemological Beliefs: The Mediator Role of Motivation
5. 'That's not the way I was taught science at school!' How Pre-service Primary Teachers in Abu Dhabi, United Arab Emirates are Affected by Their Own Schooling Experiences

Volume 25 Issue 4

1. The Impact of Online Homework on Class Productivity
2. Application of the First Law of Thermodynamics to the Adiabatic Processes of an Ideal Gas: Physics Teacher Candidates' Opinions
3. Professional Journals as a Source of Information about Teaching NOS: An Examination of Articles Published in Science & Children, 1996-2010
4. A Conceptual Change Model for Teaching Heat Energy, Heat Transfer and Insulation
5. Comparison of Argumentation and Traditional Instruction based on Student Scientific Reasoning in Turkish School Regions with Different SES
6. Salient beliefs of pre-service primary school teachers underlying and attitude "liking or disliking physics"

ICASE Member Organization Highlight: Finland

From skillful teacher in training to skillful teacher, Merike Kesler, Senior Project Manager

The Development Centre Opinkirjo promotes the welfare and development of children and youth. Opinkirjo is a Finnish non-profit organization which develops and provides services and content for school clubs and educational activities, morning and afternoon activities, extracurricular activities, culture and science education, citizenship education, media education and entrepreneurship education since the year 1947. The materials and services Opinkirjo provides are intended to be free of charge to ensure financial equality for all users.

Opinkirjo believes that diverse science education promotes children's scientific literacy and that the teachers play an important role in the work. Free of charge science clubs offered at schools as an out-of-school activity are in many cases the only opportunity for a child to get any supported science hobby. For that reason, teacher training to lead student clubs is extremely important. Even more important is that teachers in training have opportunities to practise and learn how to lead educational clubs. Since the Development Centre Opinkirjo concentrates on the development of school clubs and their related activities, two new projects have been developed in that area. In these projects, pedagogy focused on leading clubs and co-operation principles for non-profit organizations and universities were developed and studied.

At the core of the projects are courses offered at teacher training departments of universities. These courses are aimed for teachers in training and are offered at the universities. One course is called *Science club and camp leading* and is developed hand-in-hand with the University of Helsinki. As a result, the university and the non-profit organizations may use the best of their own know-how. The lectures are prepared collaboratively and the students are mentored by both sides. The result is that the teachers in training obtain important experiences by leading a real science club at the local schools.

Teachers in training learn to discuss their own science subject with the children as well. Thus the course is a place for science popularisation. The other course offered is about developing *creative problem solving*. The teachers in training focus on the methods and learn to use these during their teacher practise and gain understanding of the problem solving process which is crucial in science education. Both of these courses are popular among the students and the feedback is encouraging non-profit organizations to gain the knowledge and tools to organize courses on a university level.

For more information about the science education goals and activites of the **Development Centre Opinkirjo** please see:

www.opinkijro.fi
www.facebook.com/opinkirjoc

www.tukoke.fi
www.facebook.com/tutkikokeilekehita

ICASE World STE2016

MARK YOUR CALENDARS FOR THE ICASE World Science and Technology Education Conference in Antalya, Turkey on 31 October - 4 November 2016

http://www.icase2016.org

The ICASE World STE Conference brings together policy makers, curriculum developers, scientists, science and university educators and researchers, science teacher association officers and of course primary and secondary science teachers.

Theme: **Interdisciplinary Research Practices in Science and Technology Education**

Strands for the ICASE 2016 World STE Conference:

Strand 1: Science Learning: Understanding and Conceptual Change, Contexts, Characteristics and Interactions
Strand 2: Science Learning in Informal Contexts: Science Communication & Science Centers
Strand 3: Science Teaching: Characteristics and Strategies
Strand 4: Critical Analysis of Science Textbooks
Strand 5: Pre-service Science Teacher Education
Strand 6: In-service Science Teacher Education
Strand 7: Curriculum Development, Evaluation, and Assessment
Strand 8: Cultural, Social, and Gender Issues
Strand 9: Information and Communication Technologies in Science Education
Strand 10: History, Philosophy, and Sociology of Science
Strand 11: Environmental Education
Strand 12: Innovation & Entrepreneurship in Science Education

----- TIMELINE FOR CALL FOR PROPOSALS TO HOST THE 2019 ICASE WORLD STE -----

March 2015: Call for Expression of Interest to STAs
June 2015: Pre-qualification of STAs
September 2015: Bidding information to pre-qualified STAs
December 2015: Submission of bids by pre-qualified STAs
March 2016: Selection of host for 2019 conference

ICASE NETWORKING

United Nations Educational, Scientific and Cultural Organization (UNESCO)

Dr. Manabu Sumida, Regional Representative for Asia, represented ICASE at the **UNESCO World Conference on Education for Sustainable Development in Aichi-Nagoya, Japan, on 10-12 November 2014.** During the event, delegates discussed the implementation of the United Nations Decade of Education for Sustainable Development (2005-2014) and celebrated the Decade's achievements. The conference showcased initiatives, actors, networks and ideas that were stimulated by the Decade. Examples of good practice from all over the world played an important role in identifying viable approaches to education for sustainable development (ESD), as well as key areas for future action in line with the Global Action Programme on ESD, which was launched at the conference. For more information see: http://www.unesco.org/new/en/unesco-world-conference-on-esd-2014/esd-after-2014/global-action-programme/

In addition, on 4 December 2014, UN Secretary-General Ban Ki-moon informally presented an advance, unedited version of his synthesis report on the post-2015 development agenda to UN Member States, available in all six UN languages: http://sustainabledevelopment.un.org/ and http://www.un.org/ga/search/view_doc.asp?symbol=A/69/700&Lang=E To participate in a call for civil society responses to the Report go to: http://bit.ly/Submit-CSO-Response-SG-Synthesis

Dr. Declan Kennedy, Mary Mullaghy and members of ISTA represent ICASE at the Union of International Associations (UIA) Round Table Europe held at the Minerva Hall of the Royal Dublin Society in Ireland on 13-14 November 2014. UIA's Associations Round Tables bring together representatives of international associations to learn practical skills, share experiences and build collaborations.

Dr. Akaneren Essien, STAN Member and Visiting Professor/Chairman of the Standing Committee on Private Universities at the National Universities Commission in Abuja, Nigeria, visited the University of Texas at Tyler on 7 January 2015 to discuss ICASE and strategic educational collaborations and opportunities in engineering education with Dr. Teresa Kennedy and Dr. Jim Nelson, Dean of Engineering.

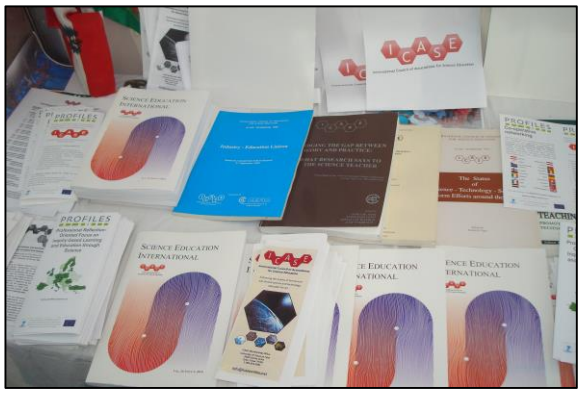
Conference Highlight: ASE

Association for Science Education (ASE) Annual Conference 2015 - University of Reading

Wednesday - Saturday, 7-10 January 2015

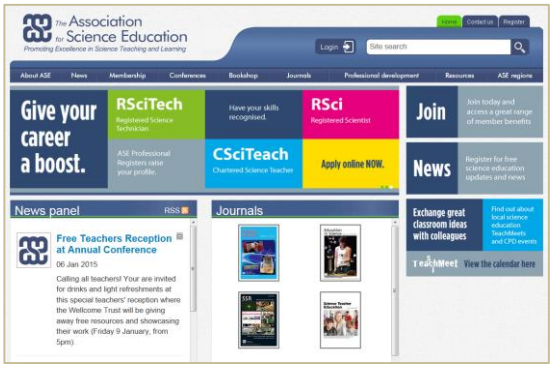
Exceptional ideas and resources for science teaching at the flagship, four-day conference from ICASE member association ASE were shared by ICASE representatives and participants from around the world. Over 300 sessions dedicated to science education across all subject areas and phases offered hands-on activities for the classroom and inspiring talks from the forefront of science research.

"The ASE annual conference is a fantastic opportunity to share ideas and best practice in science education, as well as to learn about cutting edge research. And I was blown away by the passion and enthusiasm of the science teachers I met there. There's a great feeling of community which springs from the common aim of inspiring children about science." - Professor Alice Roberts, ASE President 2014. Highlights from the ICASE stand organized by Dr. Sue Dale Tunnicliffe, ICASE European Representative, are shown below.



ICASE PROFILES Poster

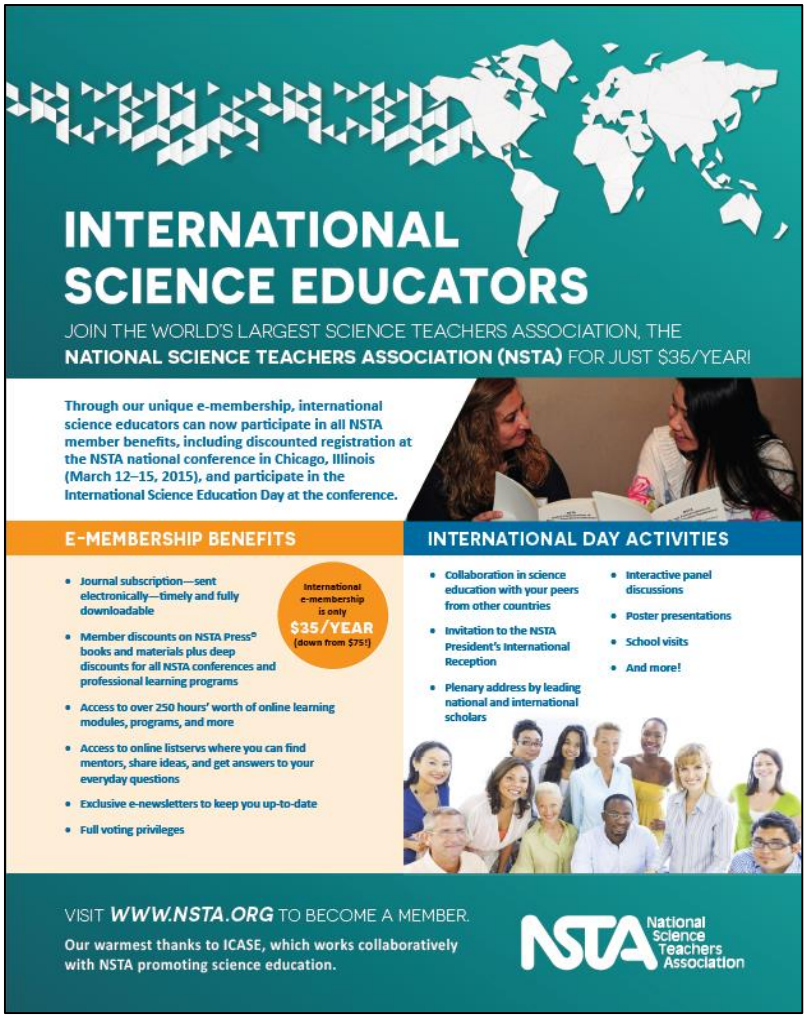
For more conference details see the ASE website at: http://www.ase.org.uk/home



2015 Calendar of Events

National Science Teachers Assocation (NSTA) Global Conversations

The NSTA International Advisory Board, together with The International Council of Associations for Science Education (ICASE) and The Council for Elementary Science International (CESI), cordially invite you to attend the 10th Annual NSTA Global Conversations in Science Education Conference on Wednesday, 11 March 2015 in Chicago, Illinois, USA, followed by the NSTA national conference held on Thursday through Sunday, 12-15 March 2015.
http://www.nsta.org/international/intlsciedday.aspx



Conference Theme
Sharing International Classroom Perspectives of Science: PreK-16

Date: Wed., 11 March 2015
Time: 1:00-5:00 PM
Ticket: M-1
Cost: $10 - by pre-registration Only, Limit: 100

The **10th Annual Global Conversations in Science Education Conference Program consists of** plenary talks by distinguished international scholars and includes a series of interactive panels consisting of teachers, researchers, and policy makers on special topics, round table discussions involving all participants, and a poster session providing opportunities to build international connections in science classrooms. The NSTA President's Intl Reception is tentatively planned to occur immediately afterward.

Present a **GLOBAL CONVERSATIONS POSTER!** Submit a session proposal online at:
http://www.nsta.org/conferences/sessions/meetingsacceptingabstracts.aspx

Wednesday morning, 11 March 2015: **Welcome to My Classroom field trip** (Ticket: W-1), to view a science classroom and nature center in the Chicago area.

NOTE: All presenters and presiders at an NSTA conference must be registered.

2015 Calendar of Events, Cont.

Irish Science Teachers' Assocation (ISTA) Annual Conference and ICASE Symposium – Science Education at National and International Level

Background

The Irish Science Teachers' Association (ISTA) has voiced considerable concern about the quality of the Leaving Certificate syllabi published in 2014 by the National Council for Curriculum and Assessment (NCCA). The Leaving Certificate examination is a national state examination taken by students at the age of 18 years in Ireland. The examination is a "high stakes" examination as the results of the examination are used to allocate places at third level. In view of the fact that no progress was being made by the ISTA in their various submissions to the NCCA, the ISTA commissioned Professor Áine Hyland, Emeritus Professor of Education, University College Cork to study the draft syllabi published by the NCCA and to address the following two research questions:

1. What is international best practice in the drafting of syllabi for second-level curricula?
2. Is the current reform of Leaving Cert syllabi in Ireland in line with international best practice?

Professor Hyland presented the findings of her report at the ISTA Annual Conference in May 2014. A copy of the Hyland Report may be downloaded from http://www.ista.ie/news/hyland-report-0

Format of Symposium

The **ICASE Symposium** will take place on **Saturday, 28 March 2015 from 11:00 – 12:30 as a plenary session of the ISTA Annual Conference in University College Cork**. The ICASE symposium will be chaired by Dr. Declan Kennedy, 2014 ISTA Lodge Award Recipient, and will build on the work of the Hyland Report. The ISTA invites international experts in science education from ICASE, science teachers and industrialists to present their experience of syllabus design and their perspective of the Hyland Report. The speakers will be:

- Dr. Teresa Kennedy, University of Texas at Tyler, USA, and ICASE President, will speak on science education in USA with particular reference to syllabus design and resources provided to teachers in the USA to help them implement the curriculum.
- Dr. Rob Toplis, University College London Institute of Education, will give an overview of the education system in England, the examination board system and the design of syllabus specifications published by the examination boards.
- Hilary Rimbi and colleagues from St. Andrews College, Dublin, will speak on their experience of teaching the Biology, Chemistry and Physics syllabi of the International Baccalaureate.
- A speaker from Pharmachemical Ireland will talk about Industry-Education links in Ireland and give the perspective of industry on the Hyland Report.
- Dr. Jack Holbrook, Estonia, will speak on the ICASE perspective of science education with particular reference to embedding Science, Technology and Society in syllabus design as reflected in the PROFILES project.

53rd ISTA Annual Conference: 27-29 March 2015 - For more information see: http://www.ista.ie/

2015 Calendar of Events, Cont.

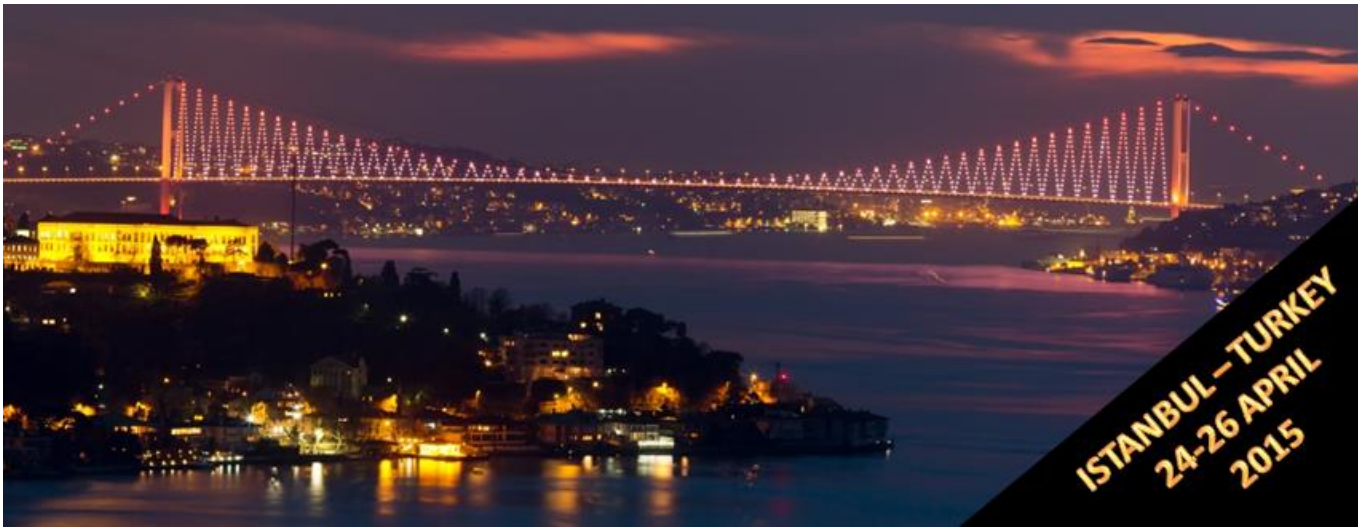
International Organization for Science and Technology Educatoin (IOSTE) Eurasia Regional Symposium & Brokerage Event Horizon 2020-Science with and for Society

Friday-Sunday, 24-26 April 2015

Bahçeşehir University - Istanbul

www.ioste2015.org

IOSTE Eurasia Regional Symposium & Brokerage Event Horizon 2020-Science with and for Society is looking forward to seeing educators, teachers, researchers, and policy makers from around the world at the IOSTE Eurasia Regional Symposium and Brokerage Event Horizon 2020-Science with and for Society, which will be held in Istanbul, Turkey. The aim of the brokerage event is to provide information about Horizon 2020 calls for proposals related to science, technology, engineering and mathematics (STEM) education and bring all stakeholders together (universities, research institutions, civil society organisations, SMEs, public bodies, science centres etc.) to promote partnerships among potential coordinators and partners in a fruitful networking environment.



International Council of Associations for Science Education

Supporting and promoting science education internationally
The ICASE Newsletter

DECEMBER 2014 - JANUARY 2015

ICASE Executive Committee 2014-2017

ICASE membership spans the world led by a Management Committee (President, President-Elect, Immediate Past President, Secretary, and Treasurer) responsible for the day-to-day administration and operation of the Council, working closely with Regional Representatives and Chairs of Standing Committees. Presidential terms are noted below.

President (2014-2017)
Dr. Teresa Kennedy
Professor, STEM Education
University of Texas at Tyler
Tyler, Texas, USA
E-mail: tkennedy@uttyler.edu
Also Membership Chair

Immediate Past President (2011-2014)
Dr. Ben Akpan
Executive Director of the Science Teachers Association of Nigeria (STAN)
Abuja, Nigeria
E-mail: ben.b.akpan@gmail.com
Also World Conference Chair

President-Elect (2014-2017)
Dr. Bulent Cavas Associate Professor
Department of Science Education
Dokuz Eylul University
Izmir, Turkey
E-mail: bulentcavas@gmail.com
Also Webmaster/Web Communications

Past President (2008-2011)
Dr. Jack Holbrook
Visiting Professor, Center of Science Education, University of Tartu
Tartu, Estonia
E-mail: jack@ut.ee
Serves in advisory capacity to the Management Committee/Also International Projects Chair

Secretary
Dr. Beverley Cooper
Associate Dean Teacher Education
Director of the Centre for Teacher Education, The University of Waikato
Hamilton, New Zealand
E-mail: bcooper@waikato.ac.nz

Treasurer
Dr. Lindsey Conner
Associate Professor, College of Education
University of Canterbury
Christchurch, New Zealand
E-mail: lindsey.conner@canterbury.ac.nz

Regional Representatives

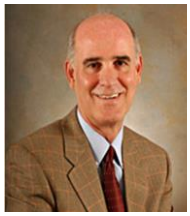
Regional Representative for Africa
Dr. Mamman Wasugu
Provost (President), Federal College of Education, Katsina State University, Katsina, Nigeria
Senate Chair, Usmanu Danfodiyo University, Sokoto, Nigeria
Professor of Science Education
E-mail: mammanwasagu@yahoo.ca

Regional Representative for Europe
Dr. Sue Dale Tunnicliffe
Professor of Science Education
Leadership, Commonwealth Association of Science, Technology and Mathematics Educators - CASTME, United Kingdom
E-mail: lady.tunnicliffe@mac.com

Regional Representative for Asia
Dr. Manabu Sumida
Associate Professor, Faculty of Education, Ehime University
Bunkyo-cho, Matsuyama City, Japan
E-mail: msumida@ed.ehime-u.ac.jp

Regional Representative for Latin America
Dr. Christiane Gioppo
Faculty Member, Universidade Federal do Paraná, Setor de Educação, Departamento de Teoria e Prática de Ensino (DTPEN)
Curitiba, PR - Brasil
E-mail: cgioppo@yahoo.com

Regional Representative for Australia/Pacific
Dr. Christine McDonald
Lecturere, School of Education and Professional Studies, Griffith University,
South Brisbane, Australia
E-mail: c.mcdonald@griffith.edu.au



Regional Representative for North America
Dr. Michael Padilla
Professor of Science Education
Former President, NSTA
South Carolina, USA
E-mail: padilla@clemson.edu

International Council of Associations for Science Education

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DECEMBER 2014 - JANUARY 2015

Chairs of Standing Committees

International Projects
Dr. Jack Holbrook
Visiting Professor, Center of Science Education, University of Tartu
Past President and Newsletter Editor
Tartu, Estonia
E-mail: jack@ut.ee

Membership
Dr. Teresa Kennedy
Professor, Bilingual/ELL/STEM Education
Director, International Division, The GLOBE Program
University of Texas at Tyler, USA
E-mail: tkennedy@uttyler.edu

Pre-secondary & Informal Science Education
Dr. Steven Sexton
Senior Lecturer, Science Education,
College of Education
University of Otago,
Dunedin, New Zealand
E-mail: steven.sexton@otago.ac.nz

Research and Publications
Dr. Baohui Zhang
Dean, School of Education
Shaanxi Normal University,
Xian, Shaanxi, China
E-mail: baohui.zhang@nju.edu.cn
Also Editor of Science Education International

Safety in Science Education
Dr. James Kaufman
President/CEO, The Laboratory Safety Institute
Natick, Massachussetts, USA
E-mail: jim@labsafetyinstitute.org

Science and Technology Education Centres
Dr. Janchai Yingprayoon
Deputy Director, International College,
Suan Sunandha Rajabhat University,
Bangkok, Thailand
janchai@loxinfo.co.th
ICASE Past President (2004-2007)

Sustainability and Environmental Education
Elaine Horne
Curtin University, Perth, Western Australia
E-mail ehorne54@iinet.net.au

University Liaison
Dr. Miia Rannikmae
Professor, Center of Science Education
University of Tartu, Tartu, Estonia
E-mail: miia@ut.ee

Web Communications
Dr. Bulent Cavas
Associate Professor, Department of Science Education
Dokuz Eylul University, Izmir, Turkey
E-mail: bulentcavas@gmail.com

World Conferences
Dr. Ben Akpan
Executive Director of the Science Teachers Association of Nigeria (STAN)
Abuja, Nigeria
E-mail: ben.b.akpan@gmail.com

World Headquarters Coordinator
Dr. Declan Kennedy
Senior Lecturer in Science Education
Department of Education, University College Cork, Ireland
E-mail: d.kennedy@ucc.ie

Assistant Editor of Science Education International
Dr. Yasemin Ozdem
Middle East Technical University
Ankara, Turkey

Science Education International
The Official Journal of ICASE
http://www.icaseonline.net/seiweb

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