



International Council of Associations for Science Education

Supporting and promoting science education internationally
The ICASE Newsletter

JUNE-JULY 2014

Welcome to the ICASE June - July 2014 Newsletter!

The ICASE Newsletter is a publication containing current information about 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 established in 1973 to extend and improve science education for children and young people throughout the world. Today, ICASE is a 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.



International Council of Associations for Science Education

<http://www.icaseonline.net>

Over the past 40 years, over 200 organizations have been members of ICASE. Currently, there are **35 organizations from 23 countries** contributing to the financial administration of ICASE. www.icaseonline.net/membership.html

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Science Education International



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ICASE News

March 2014 marked an important event within the **Irish Science Teacher Association (ISTA)** when the prestigious **Lodge Award** was presented to **Dr. Declan Kennedy**, former ICASE European representative currently serving in the role of ICASE World Conference Coordinator on the ICASE Executive Committee. It is an honor that is only awarded on rare occasions to exceptional people within the Irish Science Teacher Association (ISTA). There are only six previous recipients since its introduction in 1971 in honour of one of the founding fathers of the Association, George Lodge. Attached are some photos and a little history on the award provided by the ISTA.

Who was George Lodge?

Adrian Somerfield

Most organisations can be regarded as having had one driver and in this sense George Lodge was the creator of this Association. He was born in Tramore, Co. Waterford, in 1893, into a family who ran a well-known grocery business, was educated at the Christian Brothers Schools and then at Waterpark College in Waterford. He won a scholarship to the Royal College of Science for Ireland in 1912, and graduated A.R.C.Sc. In 1916, he went to Levinsteins, Dyestuffs Manufacturers (later British Dyestuffs Corporation and finally part of Imperial Chemical Industries) in Manchester. He returned to Dublin in 1920, and after a year at Fine Chemicals Ltd in Mary Street, he joined the staff at St. Columba's College near Rathfarnham, where he taught Physics and Chemistry until 1959 when I, a former pupil of his, succeeded him. It was, in some ways, an odd situation. This school, a boys' boarding school, was then very much in the the protestant and unionist Church of Ireland and English Public School tradition, whereas George Lodge was a devout Roman Catholic with Republican (though not violent) leanings who had been involved in the escape of Sinn Fein prisoners from Strangeways prison in 1919. And yet he fitted in and took a great interest in the school and its history, organising its archives and holding senior positions. I think both he and the school gained from his involvement.

He was very keen that science should be taught in a practical and interesting way, and that pupils should do as much practical laboratory work as possible. He set up and equipped laboratories which were probably as good as any others in Irish schools and better than most, and remained functional until replaced by a new building (not as nice to teach in!) in 1972. He thought that in a school laboratory children should be able to see interesting apparatus and chemicals around the walls and he had a wide array of bottles on the shelves which I well remember with great interest, though they have all been destroyed now and everything is locked away for Health and Safety! He was a good teacher, clear and precise, who believed that it was important to understand the principles of the subject, not just the more obvious and entertaining "froth." Science, he held, is a *discipline*.



From left to right: Ms. Mary Mullaghy (ISTA Immediate Past Chairperson), Dr. Declan Kennedy (Lodge Award recipient), and Mr. Charlie Dolan (ISTA Honorary President).

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ICASE News – cont.

After retirement, he began setting up this Association, inevitably recruiting me! He was a great recruiter and believed in getting things done and getting people involved. He was also a Demonstrator in the Physics Department of UCD from 1960 to 1966 and a lecturer to students for the Higher Diploma in Education. It was here that he was able to influence teaching in the future and also to become aware of the poor conditions of science teaching generally. He produced texts for the new Intermediate Certificate syllabus and was much involved in discussions of syllabus reform, so he had an extremely active, though short, retirement, passing away in September 1968, shortly after the AGM in Cork.

(Adapted from Science, Volume 6, Number 2, October 1968)

Additional highlights from The Irish Science Teacher Association (ISTA) 2014 Annual Meeting



Manning the ICASE booth and distributing ICASE materials at the ISTA Annual Conference are (left to right): Dr. Declan Kennedy, Dr. Teresa Kennedy (ICASE President), Mr. Seán Finn and Mr. John Lucey.



Illustrating a Teaching /Learning Module, developed by The University College Cork (UCC) and ICASE within the European Commission supported FP7 science and society project called PROFILES. For more details on PROFILES visit the ICASE website at www.icaseonline.net/profiles/.



Dr. Declan Kennedy presents the second addition of his textbook "Chemistry Live" to participants at the conference. From left to right: Dr. Michael Odell (NASSMC President-USA), Dr. Teresa Kennedy (ICASE President), Dr. Declan Kennedy, Dr. Dianne Robinson (Professor, USA), and Mr. Conor Walker from Folens Publishers (Ireland).



Kuching Declaration on Science and Technology Education (INTERNATIONAL COUNCIL OF ASSOCIATIONS FOR SCIENCE EDUCATION)

<http://www.icaseonline.net/const.html>

The ICASE World Conference on Science and Technology Education was held in Kuching, Malaysia 29 September - 3 October, 2013. We, the conference participants from 34 countries, believe that Science and Technology Education at all levels should prepare students for their future lives as global citizens.

Access to high quality education is a fundamental right for all. In times of global vulnerability, issues such as sustainability, health, peace, poverty alleviation, gender equity and biodiversity conservation need to be at the forefront of thinking, planning and actions related to strengthening Science, Technology, Engineering and Mathematics (STEM) education. While the relative balance and emphases of these disciplines varies around the world, it is the interrelatedness and combination of these that will propel progress.

Planning and implementing effective STEM education includes an emphasis on the development of life competencies such as evaluative inquiry, problem solving and decision-making skills, and working collaboratively in teams. The development of confident life-long learners with skills and attitudes to thrive in complex societies is a high priority. Implementation efforts should make health, safety and environmental sustainability an integral and important part of education. Social responsibility should be established as an educational goal for all. Education is essential for Sustainable Development.

The conference participants call upon all involved in research, policy development and the teaching of STEM disciplines to carry out their roles actively in implementing this Declaration in their regions of the world, acknowledging the key roles of teachers.

We resolve that:

1. Learning through STEM disciplines should prioritize activities and content that is relevant to children's worlds, including their environment, communities, resources, cultures and interests.
2. Learners can be activated through a range of pedagogical approaches that provoke meaningful thinking about scientific issues from a young age to help them develop social responsibility.
3. The quality of teachers of science and science teaching is paramount. Opportunities for ongoing teacher professional learning through collaboration are critical.
4. ICASE through its members and member associations will create opportunities for teachers of science at all levels to be involved in collaborative feedback opportunities to benefit from lessons learned internationally.
5. High quality teacher education programmes should model evidence-based practice where teachers of science use evidence of student progress to adapt and modify what they do.
6. Science Teachers Associations are encouraged to form in all nations. They should take responsibility for representing teachers' and students' voices and needs in science, STEM and sustainability education at all levels.
7. Member organizations of ICASE will support joint initiatives to develop quality free online teaching resources. Associated workshops should support the development of innovative approaches to using ICT and utilize established resources developed by Science Teacher Associations around the world as well as UNESCO.



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8. ICASE through its members and member associations will contribute to policy development and evaluation of the impacts of STEM education initiatives.
9. Policy should ensure investment in interdisciplinary sciences at all levels of education to provide sufficient numbers of science and STEM professionals and innovators.

Given the importance of environmental sustainability to the future of our planet, ICASE members also resolve to take action on the following:

1. Provide students of all ages with opportunities to experience and connect with the natural environment.
2. Promote a sense of care and shared responsibility for the Earth through STEM education about global issues and environmentally sustainable development principles.
3. Empower all students to develop the skills and attitudes to address issues and solve problems in their current and future lives.
4. Revise teacher education programmes to include critical thinking related to environmental and sustainability education that engages authentically with local communities.
5. Environmental sustainability programmes should take account of local and indigenous worldviews as well as science ideas.
6. Disseminate research information on the impacts of human activities on the environment, such as climate change and biodiversity, to better enable this information to be incorporated into STEM education.
7. Science education associations must prioritize environmental and sustainability education within their committees, support and opportunities that they provide.

ICASE acknowledges and appreciates the valuable input provided throughout the development of the Kuching Declaration on Science and Technology Education from our colleagues in the Science Education Thematic Cross Cutting Unit, Natural Sciences Sector at UNESCO Headquarters in Paris, and from UNESCO's Regional Science Bureau for Asia and the Pacific in Jakarta.

ICASE World STE2013 Conference: BORNEO, MALAYSIA

28 SEPTEMBER – 3 OCTOBER 2013

The 4th ICASE World Conference on Science and Technology Education took place on the island of Borneo in Kuching, Malaysia. The ICASE General Assembly took place on 29 September 2013, 124 delegates representing 15 paid ICASE member organizations from 10 countries (ICASE currently had 23 paid organizations representing 17 countries at that time, a number that has grown since then), reviewed the ICASE Strategic Plan and accompanying Implementation Plan, discussed financial aspects of the organization as well as held elections. There were over 450 registered participants at the ICASE WorldSTE2013 event and it was reported that there were over 500 participants at the larger STEM festival that took place at the same time during the week. It was quite an event with a lot going on. We thank the entire ICASE network for their contributions and active participation throughout the conference via presentations, poster sessions, panel discussions and input to the Kuching Declaration. A special thank you to Elaine Horne, Chair of the World Conference Standing Committee (2010-2013).

THE ICASE WORLD STE2016 WILL TAKE PLACE IN ANTALYA, TURKEY

30 October – 4 November 2016

<http://www.icasest2016.org/venue/>

Conference details will be available on the ICASE website soon.



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<http://www.icasest2016.org/venue/>



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The ICASE – Guangxi Normal University Science and Technology Education Centre



'THE CENTRE,' as it is affectionally called, is a joint (equal partner) collaboration between ICASE and Guangxi Normal University.

The Goals

- To build on the current developments within the RISE centre, especially the 'Innovation in Science and Technology Education.'
- To further promote research in science education (where science* is equivalent with the integration of STEM as an interdisciplinary concept).
- To recognise the need to integrate conceptual science within technology design – towards a vision of STEM (Interdisciplinary approach).
- To identify the role and concept of engineering education within the concept of STEM (an integration of science education involving conceptual science - especially inquiry-based science education and socio-scientific decision making - with technological design and construct).
- To recognise that the purpose of teaching science* in school is for (a) a base for further learning (lifelong learning), (b) responsible citizenship, (c) employability skill.

In promoting a science competence -based curriculum, the target for education in schools is no longer simply to develop abilities related to knowledge and skills, but to also develop in students the capability to apply their learning in new or unfamiliar areas. This provides students with a preparation for an unknown future with its predicted developments in the field of science, technology and engineering and also in the applications of digital technologies.

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The Way Forward for the ICASE – Guangxi Normal University S&T Education Centre

Short term goals

1. Further develop local programmes in schools toward greater integration for the science concepts within the design technology approach.
2. Promote greater teacher-to-teacher interaction so as to learn and discuss with other teachers, including other school teams and hence moving towards a network exchange of ideas/operations/successes/failures/concerns, among other strategic efforts.
3. Organize an international conference to disseminate the ideas with the putting forward of specific, tried-out examples.
4. Establish or expand an ICASE-RISE website in English/Chinese to link with other ICASE centres (also promoted from the ICASE website and ICASE journal/newsletter/teaching materials).
5. Initiate wider dissemination of developments taking place within, and from links with, the RISE centre, associated with Innovations in STEM.
6. Develop articles in SEI and other international journals citing research in developments on evaluation of curriculum design, teaching, student reactions, student achievements.
7. Give greater image to the centre by including more names (with specialities) in publicity documents – see the centre as a functioning and diverse body.
8. Involve research students (in Guangxi Normal University) in developments within the centre and to provide opportunities for interacting/collaborating/developing/researching.

Long term goals

1. Initiate a Delphi curriculum research study, consolidating different stakeholders' views (those influencing school developments) to promote further collaboration and strengthen the place of the centre in the education system and the work of the centre.
2. Develop (as a research project) alternative assessment structures that pay more attention to the goals of science education (promoting the knowledge, skills, attitudes and values, as well as assessment beyond PISA).
3. Take steps towards the inclusion of M-learning (mobile learning) within the science* education.
4. Become the lead centre in China for promoting science* education for the 21st century.

Prof. Jack Holbrook
Chair, ICASE International Projects

Dr. Janchai Yingprayoon
Chair, ICASE S&T Education Centres

SPECIAL HIGHLIGHT:

ICASE 2013 Distinguished Service Award - Dr. JANCHAI YINGPRAYOON

Professor Dr. Janchai Yingprayoon received a German Government Scholarship to study a Ph.D. in Laser Physics from Free University in Berlin, German. Involved in ICASE since 1979, he became an ICASE Regional Representative for Asia in 1993, and later served as ICASE President from 2004-2007. Dr. Yingprayoon currently serves as the ICASE Chair of our Science and Technology Education Centres.



He worked as an assistant director of the Institute for the Promotion of Teaching Science and Technology (IPST) in Thailand for many years and is currently working as a Deputy Director of Suan Sunandha Rajabhat University, an International college in Bangkok, Thailand, and also serves as a visiting professor at Guangxi Normal

University in Guilin, China. He received an outstanding university lecturer award from the King of Thailand in 1982, and was also invited to meet the King of Saudi Arabia during a recent teacher training that he conducted for talented children in Jeddah, Saudi Arabia. He has worked extensively with UNESCO and is a creative and humorous lecturer who makes learning science fun and meaningful. He is a well-known international speaker and has been invited to many international conferences as an honorable keynote speaker. Janchai has conducted innovative workshops in 24 countries around the world.



Dr. Janchai Yingprayoon received the ICASE Distinguished Service Award at the WorldSTE 2013 Conference in Kuching, Malaysia.

A celebration of a few of his recent activities follows!

Activities in India

Janchai was recently invited to give talks to schools in India, as well as to give an entertaining science lecture to the public. A group of Schools, SRI PRAKASH VIDYANIKETAN in Visakhapatnam, India celebrated their 13th Anniversary during 11-14 February 2014 led by Prof. Dr. Sudhakar Agarkar, who has been working with ICASE and CASTME for many years. The schools are interested in joining ICASE initiated activities stimulated by ICASE Science and Technology Centres.





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Activities in China

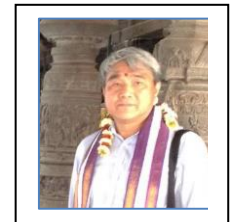
In March 2014, Janchai organised, together with Prof. Luo Xingkai, an informal meeting devoted to the planning of future ICASE Science and Technology Education Centre activities to occur in Guilin, China. Also arranged were school visits in Guangxi Province, China to see science teaching in action and to see how technology was being interpreted (in an engineering context).

The China Association for Science and Technology (CAST), an ICASE member, is organizing the 29th China Adolescents Science and Technology Innovation Contest scheduled for 21-26 August 2014 in Beijing, China. For more information see: http://sic.newgen.org.hk/load.php?link_id=107082. See page 15 for more details!

Activities in Thailand

The Prince of Songkla University (PSU), Surat Thani Campus, and PSU Wittayanusorn School in collaboration with the ICASE Centre will hold an International Workshop on Teaching Science and Mathematics using Low Cost High Tech Materials from 13th to 15th October in Surat Thani Province, Thailand. See page 16 for more information!

Workshop website: www2.surat.psu.ac.th/ICASE-PSU/



International Advisory Committee

- Janchai Yingprayoon Thailand
- Jack Holbrook UK
- Milia Rannilmae Estonia
- Luo Xingkai China
- Manabu Sumida Japan
- Bulent Cavas Turkey
- Lee Shok Mee Malaysia
- Cheng Fun Singapore
- Sudhakar Agarwal India
- Alexander Fishman Russia

Presentations

- Oral presentations
- Poster sessions
- Workshops

Accommodation

Special room rate at the Diamond Plaza Hotel, Surat Thani, Thailand will be reserved upon requested.

Organizers

PSU Surat Thani Campus
PSU Wittayanusorn, Surat Thani, Thailand

Co-organizers

International Council of Associations for Science Education (ICASE)

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The International Workshop on Teaching Science & Mathematics using Low Cost High Tech Materials

13-15 October 2014

**Diamond Plaza Hotel
Surat Thani, Thailand**

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Activities in Singapore

Synergyst, a training company in Singapore, has worked with ICASE for many years and organized an ICASE Asian Symposium in 2009. Working with Synergyst, Janchai conducted teacher training workshops at Maris Stella Primary School, St. Nicholas Primary School and Temasek Polytechnic in Singapore from 5-9 June 2014.



Activities in Russia

From 24 - 26 April 2014, Schools in Russia interested in joining ICASE initiated activities attended Kazan Federal University's **Science Week** in Kazan, Tatarstan, Russia. Janchai gave talks to students as well as served as one of the committee members for their Science Project competition.



Activities in Malaysia

The Association of Professional Early Children Educators in Malaysia organized the 1st International Conference on Early Childhood from 24-25 May 2014. Datin Dr. NG Soo Boon, Chairperson of the Association, has been involved in several ICASE related activities and invited Janchai to provide a plenary talk on "Creativity Development through Inquiry Learning and Exploration" and discussions on new ICASE activities.



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Safety As A Second Language

James A. Kaufman, Ph.D. President/CEO, The Laboratory Safety Institute (LSI)
Chair, ICASE Committee on Safety in Science Education

Many of us are concerned that scientists, science educators, lab workers, and lab supervisors may not understand the Language of Safety and the basic lab safety vocabulary. What's to be done? Let's offer a course in **Safety as a Second Language!** It's not different from learning French, Spanish, German or Italian—one must learn the vocabulary. In the absence of such courses, here are some simple suggestions:

1. On your departments (research groups) lab safety bulletin board, have a section devoted to vocabulary. Every time you find a new word, write it on a 3x5 index card, put the definition on the back, and post it. When there are 25 new words, the department chair (or PI) needs to treat everyone to ice cream. The chair or PI need to post the first word!
2. Add to LSI's online Lab Safety Dictionary: <http://www.resources.labsafetyinstitute.org/LSD.html>
3. Create a vocabulary quiz so you can test your LSIQ. Please share the vocabulary quizzes you create.
4. Produce a deck of lab safety language flash cards with words on one side and definitions on the other. Study them!

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.

Learn more about the Committee on Safety in Science Education at <http://icaseonline.net/safety.html>.

The Laboratory Safety Institute's...

Laboratory Safety Guidelines

40 Suggestions for a Safer Lab

Steps Requiring Minimal Expense

1. Have a written health, safety and environmental affairs (HS&E) policy statement.
2. Organize a departmental HS&E committee of employees, management, faculty, staff and students that will meet regularly to discuss HS&E issues.
3. Develop an HS&E orientation for all new employees and students.
4. Encourage employees and students to care about their health and safety and that of others.
5. Involve every employee and student in some aspect of the safety program and give each specific responsibilities.
6. Provide incentives to employees and students for safety performance.
7. Require all employees to read the appropriate safety manual. Require students to read the institution's laboratory safety rules. Have both groups sign a statement that they have done so, understand the contents, and agree to follow the procedures and practices. Keep these statements on file in the department office.
16. Extend the safety program beyond the laboratory to the automobile and the home.
17. Allow only minimum amounts of flammable liquids in each laboratory.
18. Forbid smoking, eating and drinking in the laboratory.
19. Do not allow food to be stored in chemical refrigerators.
20. Develop plans and conduct drills for dealing with emergencies such as fire, explosion, poisoning, chemical spill or vapor release, electric shock, bleeding and personal contamination.
21. Require good housekeeping practices in all work areas.
22. Display the phone numbers of the fire department, police department, and local ambulance either on or immediately next to every phone.
23. Store acids and bases separately. Store fuels and oxidizers separately.
24. Maintain a chemical inventory to avoid purchasing unnecessary quantities of chemicals.
25. Use warning signs to designate particular hazards.

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Website: www.labsafetyinstitute.org

- * "The Laboratory Safety Pocket Guide", 1996, Genium Publisher, One Genium Plaza, Schenectady, NY
- * "Safety in Academic Chemistry Laboratories", ACS, 1155 Sixteenth Street NW, Washington, DC 20036
- * "Manual of Safety and Health Hazards in The School Science Laboratory", "Safety in the School Science Laboratory", "School Science Laboratories: A guide to Some Hazardous Substances" Council of State Science Supervisors (now available only from LSI.)
- * "Handbook of Laboratory Safety", 4th Edition, CRC Press, 2000 Corporate Boulevard NW, Boca Raton, FL 33431
- * "Fire Protection Guide on Hazardous Materials", National Fire Protection Association, Batterymarch Park, Quincy, MA 02269
- * "Prudent Practices in the Laboratory: Handling and Disposal of Hazardous Chemicals", 2nd Edition, 1995
- * "Biosafety in the Laboratory", National Academy Press, 2101 Constitution Avenue, NW, Washington, DC 20418

One of the Committee's major projects has been the translation of **Laboratory Safety Guidelines: 40 suggestions for a safer lab.**

Today, more than four million free copies have been distributed in thirteen languages: Arabic, Bengali, English, French, German, Japanese, Korean, Mandarin, Persian, Russian, Spanish, Thai, and Turkish. Forty-three percent of the world's population speak these languages. The Guidelines are available on the ICASE website.

Mothers Talking Science Project at Sreepur Village in Bangladesh

Sue Dale Tunnicliffe, ICASE European Representative

This project, under the auspices of CASTME, was launched 4 years ago. Its aim and objectives are to encourage the women at Shushi Polli Plus, the Bengalis name for this purpose built village, to learn about everyday science and technology in their lives and talk with their children about it. Most of the women received little if any school education and did not study any science.

The new facilitator, who has a degree in Soil Science, has just begun and he has 5 groups of women who meet weekly. He also is running workshops for children (Sreepur has its own government primary school) and some activities on Fridays for mothers and children. The mothers make Big Books from the paper they make as one of the trade activities of Sreepur, and have printouts of photographs they take of what interests them and why, as well as drawings they make of the science and technology phenomena that interest them in the village.

The facilitator has established an everyday science trail; here are two photographs of Group B with the questions he discussed with the science talkers!



Topic: Ramp

Questions:

1. What is a Ramp?
2. Why is it used?



Topic: Sun light and Shadow relationship

Questions:

1. Where do the Sun rays come from?
2. What is a shadow?
3. What is the sun & shadow relationship?



The new group with CASTME chair and ICASE European Representative Dr.Lady Tunnicliffe and Angshuman Sarker



Sreepur Village



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Science Education A Global Perspective

Ben Akpan, Editor

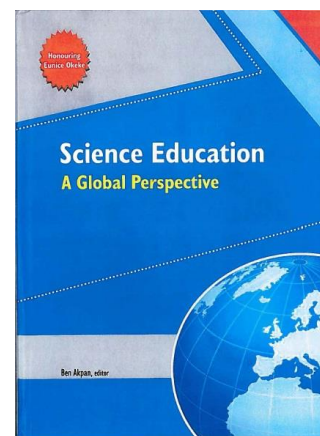
CEO STAN, ICASE Past President

Published 2013 by Next Generation Education Ltd, Abuja, Nigeria

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- 2: The Relationship between Science and Religion – a contentious and complex issue facing science education, *Keith S. Taber (England)*
- 3: Representing evolution in science education: The challenge of teaching about natural Selection, *Keith S. Taber (England)*
- 4: History and philosophy of acidity – engaging with learners by a different route, *John Oversby (England)*
- 5: Psychological Foundations of Science Education including Learning Theories and Models of Teaching, *Chinwe Nwagbo (Nigeria)*
- 6: Motivational Science Teaching using a Context-based Approach, *Jack Holbrook (Estonia)*
- 7: Science Education or Education through Science: which is it in the New Zealand Curriculum? *Steven S. Sexton (New Zealand)*
- 8: Towards a socially responsible science education, *Gilbert Onwu (South Africa)*
- 9: Science Education for National Development Indian Perspective, *Sudhakar C. Agarkar (India)*
- 10: Ethnoscience and Sustainable Science Education for Africa, *Okechukwu Sunday Abonyi (Nigeria)*
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Preface

This book, 'Science Education: A Global Perspective,' is 'global' both in content and authorship. It seeks to bring to the fore current developments in science education and the implications arising therefrom. These developments should make us to explore how to improve on the quality of delivery of science education by shaping our opinions as we earnestly hope that everyone should have some opinion on the way forward for science education for having no opinion about what direction to follow is not good news for the sector. Thus the ideas expressed in this book are not expected to lead to a specific course of action. On the contrary, they are to promote discourse and thereby advance the cause of science education in all its ramifications.

The opening chapter demonstrates the high premium currently being laid on the nature of science especially in relation to argumentation as the basis of providing a solid foundation for future growth and deeper understanding of science concepts.

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This is followed in a natural sequence by equally argumentative subjects as the relationship between science and religion along with the representation of evolution in science education is explored. The challenge here demonstrates the dilemma that we continue to face, namely how to impart science education in ways consistent with the nature of science and at the same time being sensitive to the divergent beliefs and traditional views that students hold. Following this is a vivid alternative strategy to the teaching of acidity in a marked departure from some time-honoured approaches.

An overview of psychological foundations of science education provides a platform for discussion on motivational science teaching using a context-based approach anchored on the 'education through science' movement. This is further elaborated with specific reference to New Zealand. The clarion call for a paradigm shift towards a socially responsible science education that caters for learner priorities and needs thus meeting the requirements of multiculturalism is an extension of this discourse. So also are the examples and illustrations from India and the consideration of ethnoscience and sustainable development as these further expand the frontiers of relevance in science education just as the strong case being made for greater attention to learners in special needs.

The Portuguese curriculum is designed and implemented based on the assumption that teachers transform; reinterpret those guidelines in light of their knowledge, experiences, and conceptions about the teaching process. This is highlighted along with the position that a major strategy of achieving our educational objectives in the context of increased enrolment at the basic education level is the application of efficient and effective pedagogical strategies especially in the face of large size science classes.

The chapter on SEAMEO-RECSAM, an organisation located in Malaysia, shows how a regional organisation has provided the platform for the promotion of cooperation in education, science, and culture. In Nigeria, the Science and Technology education Post-Basic (STEP-B) project catalyses an increased production of more and better quality medium and higher-level skilled workers and strengthens the capacity of federal post-basic science and technology institutions to carry out this task. The two chapters on RECSAM and STEP B provide the required background for the discussion of the professional development of the science teacher, the issues of endogenous research and innovation, indigenous knowledge, as well as the coaching of students.

Providing equitable access is a step toward reducing barriers to high achievement. However, reform programmes need to consider other typical obstacles to Education for All (EFA): teachers' expectations and instructional models. Even when women complete STEM studies they are less likely than men to work in these sectors. Teachers should emphasize the flexibility and wide applications of computers providing information on the availability of user-friendly computer training manuals and software. The effects of the pervasive masculine image of STEM should be discussed among students and teachers so that everyone understands them and becomes able to identify their roles in the perpetuation of the stereotypes. These are some of the ideas coming through in three chapters of the book.

There is the view that STME research has evolved through time and has become very vast and sophisticated. Beyond this, the book examines future trends for science education research by using selected works to highlight trends, issues, and the implications for research. It ends on an optimistic note by looking at science education in 50 years' time with a recommendation, among others, for stakeholders to take the responsibility of preparing children towards a blossoming science education sector in an anticipated future world.

I am immensely grateful to all the contributors to this book.

Ben Akpan

Abuja, Nigeria

1 August, 2013

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Calendar of Events Occurring around the World

The following pages describe events you won't want to miss!

CHINA

29th China Adolescents Science and Technology Innovation Contest

21-26 August 2014, Beijing, CHINA

Organised by the Children & Youth Science Center of CASTZ

3 Fuxing Rd. Beijing, 100038, China

Dear Leaders,

As of 5 June 2014, CASTIC has received the following countries' confirmed participation: Thailand, India, ROK, Japan, France, Luxembourg, Germany, Sweden, Norway, Denmark, and Brazil. We are pleased to inform you the following information that might help you with preparation of your team for the 29th CASTIC.

Online Registration

Online registration (<http://www.cyscc.org.cn/>) is open from now through 4 July 2014.

Some attention needs to be given when you register.

- 1) For the part of passport image please update the scanned passport page of personal information which we will issue the visa letter according to.
- 2) For the part of personal information please update your personal images and we will make badges for you based on it.
- 3) Flight information is important, which the pickup and drop-off depend on.
- 4) Please fax or email the confirmation page after you finish registration.

Exhibit Dimensions: Each project will be provided with a display area of 100cm in depth, 200cm in width and 200cm in height and an exhibit board of 120cm x 90cm. Models and other displaying items are allowed within the maximum exhibit dimensions.

Judging and Awards: The jury evaluates the projects and interviews international students in English. The special awards for international students split into three classes: First Award, Second Award and Third Award. The certificates of awards and participation are issued by the organizer committee and will be given to the students after the award ceremony.

Payment of Fee: The charge for additional visitors is USD\$1200 each containing food, lodging for a single room, local transportation and cultural visit during the 29th CASTIC. Payment in cash on arrival is acceptable. A soft copy of receipt with payment details will be offered.

Volunteer Service: The volunteer speaking English is available for every 2 teams during the 29th CASTIC. You will be met with your volunteer at airport upon arrival. Please be noted that volunteers will be your first contact and important source of information when you face problem during the contest.

Traveling: Please login into the online registration of the CASTIC to provide your flight information. The pick-up and see-off service are provided by the Organizing Committee only on the arrival date of Aug. 21st or 22nd and the departure date of 26 August 2014.

Lodging: All leaders, visitors and finalists will be staying at Beijing Riverside Hotel, located at No.15 Shejichang Rd. Fengtai District, Beijing. Leaders and visitors will stay in single room and finalists will be asked to share a double room arranged by gender. If your team is planning to come to Beijing earlier than Aug. 21st or depart later than Aug. 26th, please contact us in advance and we would be glad to assist you in reserving proper accommodation. Please kindly note that we will assist for accommodation beyond CASTIC period on payment only. If you require Hotel Reservation, please contact Mr. Qian Cheng at qiancheng@cast.org.cn.

Visa: It is highly recommended that you prepare for visa application at your earliest convenience and contact China Consulate to find out any materials in need. If you need a Letter of Authorization for Visa, please upload the scan-copy of all passport information pages in the online registration of the CASTIC.

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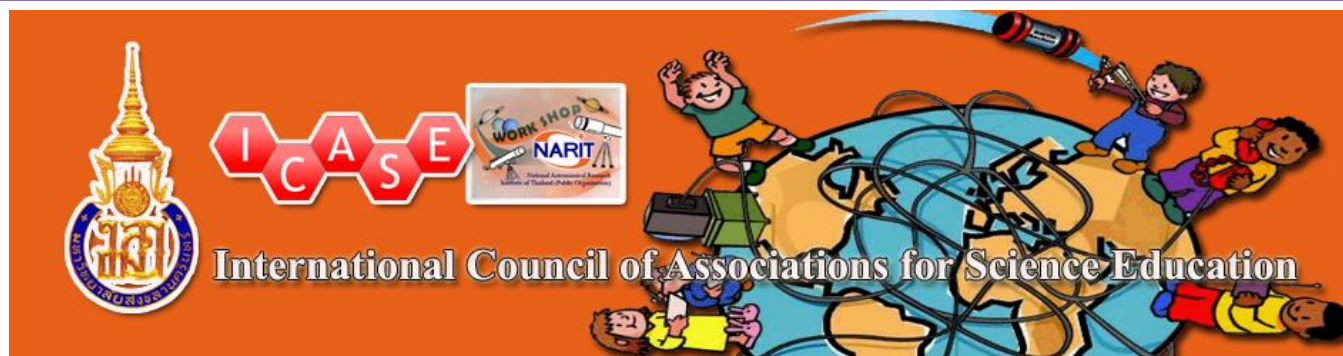
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Dear colleagues:

On behalf of the organizing committee from **Prince of Songkla University**, it is my great pleasure to invite and to welcome you all to the International Workshop on **Teaching Science & Mathematics using Low Cost High Tech Materials** which will be held at Wangtai Hotel, **Surat Thani, Thailand**: 13th-15th October 2014. The workshop contents will cover the scientific and mathematical research and teaching.

THAILAND

Topics include:

- Using a laser beam in teaching Science and Mathematics;
- Multimedia learning in Science and Mathematics;
- Science exhibitions and Museums Science show;
- Application of smart phones and tablet in Science and Mathematics; and
- Digital equipment for teaching Science, etc.

This will provide an opportunity for science, mathematics and technology educators from schools, universities, scientists to meet together in order to share ideas and experiences in using low cost but high tech materials for teaching. Moreover, to interact with educators who are interested in science, mathematics and technology education from different fields at all levels and to recognize approach to promote scientific and technological literacy for all.

We would like to warm welcome all participants around the world to join this workshop. My colleagues and I hope that the you will actively participate with very successful and useful outcomes.

After, the workshop, those of you who would lke to experience the beautiful world recognized sightseeing destinations like Koh Samui, Khao Sok and many other impressive places around Surat Thani areas are invited to chose the trip as your wish from the arranged tour company.

I look forward to seeing you in Surat Thani, Thailand during the schedule of the workshop.

With my best regards,

Associate Professor Dr. Charoen Nakason

Vice President for Prince of Songkla University, Surat Thani Campus

Workshop website: www2.surat.psu.ac.th/ICASE-PSU/

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INDIA



Science and Mathematics are the two driving forces in the development of the nation. These disciplines provide ample opportunities to try out innovative ideas to solve our day to day problems. Sri Prakash Vidyaniketan organised the 1st International Children's Science & Mathematics Festival from 9-11 November 2012 at Visakhapatnam.

It was a great success drawing 64 projects from India, Hong Kong, Thailand, Dubai and Italy. Apart from providing hands on opportunities the festival enabled to foster scientific temper among the students. The event evoked a good response from the society in general and from educational institutions in particular. Encouraged by the positive experiences of the First Festival Sri Prakash Vidyaniketan proposes to arrange the 2nd International Festival for school children in Science and Mathematics with the theme "Science & Mathematics in daily life" from November 13 to 15, 2014. This festival would bring together innovative students and teachers from India and overseas countries. Visakhapatnam is a historical city in the state of Andhra Pradesh of India. Located on the east coast of India on the shores of Bay of Bengal, it is easily approachable both by air and surface transport. Sri Prakash Vidyaniketan established in 2001 is a major institution providing quality school education in the city of Visakhapatnam. With a good network of schools it caters to the educational needs of about 4,000 school children from the city and around. Along with imparting formal education it strives to provide international exposure to its students. The Organizing Committee would like to take the opportunity to invite you to participate in the proposed international festival. We would be grateful if you could send a team of 2 students and a mentor to participate in the festival. Apart from displaying their exhibits they will get a rare chance to listen to lecture demonstrations by renowned educators in Science and Mathematics. Ample number of hands on opportunities will be provided to each participant during the festival. If you wish to participate in the festival please fill the "Reply Sheet" below and send it to us before 31 July 2014 with a short abstract of the proposed project. We would be happy to provide local hospitality for outstation participants for a group of 3 persons per project for the duration of the festival at Visakhapatnam. Please note that the participating children should be in the age group of 11 to 15 years. Each school can send only one project either in Mathematics or Science with two students and one accompanying teacher. Note: Organising committee has a right to reject the project/exhibit without assigning any reason.

-----Reply Sheet-----

We would like to participate in the 2nd International Children's Science & Mathematics Festival to be organised by Sri Prakash Vidyaniketan at Visakhapatnam from November 13 to 15, 2014. Details about the project/exhibit along with the names of participants and the name of the mentor teacher are given below for your perusal.

Names of Participating students: Class Age Gender (M/F)

- | | | | |
|---------|-------|-------|-------|
| 1. | | | |
| 2. | | | |

Name of the mentor /teacher:

Name of the School:

Postal Address:

Contact Ph. Numbers:

Mobile Phone Numbers:

Fax Numbers:

Email Address:

Title of the Project/ Exhibit:

Signature of the mentor:

Date:

Send completed form to:

Chitturi Vasu Prakash

Email: icsmf@sriprakashschools.com

Phone: 0891-6662299; 2719336/7

Fax: 0891-6665599



Signature of the head of the institution with Seal:

Date:

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USA

**NSTA GLOBAL
CONVERSATIONS IN
SCIENCE EDUCATION
CONFERENCE**

MARCH 12, 2015

Also at the conference – one
FULL day of interacting and
networking with international
educators!

2015 National Conference in Chicago

Conference Strands

To help you make the most of the professional development opportunities available at the Chicago conference, the Conference Committee has planned the conference around four strands that explore topics of current significance, enabling you to focus on a specific area of interest or need.

Natural Resources, Natural Partnerships

Sustaining natural resources requires collaborative partnerships among many stakeholders, and science is the key to making smart decisions about resources. Educators and students can engage with environmental groups, agencies, and businesses to build and support a sustainable future. This strand will help teachers identify possibilities and potential partnerships.

Teaching Every Child by Embracing Diversity

All classrooms are diverse. Learners bring a variety of cultures, backgrounds, and experiences to the study of science. Educators must provide opportunities to meet the needs of all students, including English language learners, students with special needs, and those with diverse learning styles and abilities. Successful instructional approaches must address methods, materials, facilities, and partnerships. These sessions will confirm the belief that every student can excel in science.

The Science of Design: Structure and Function

Architecture and engineering provide the infrastructure for human-made systems. Designing for the future requires imagination and a commitment to sustainability. It also involves the crosscutting concepts of structure and function and the practices of science and engineering. Communities like Chicago provide examples of great design and great science.

Student Learning—How Do We Know What They Know?

The goal of every teacher is to maximize student learning. Monitoring learning is the responsibility of both the teacher and the student. To successfully monitor learning requires authentic assessment, including formative and summative strategies. The progressions embedded in the NGSS provide opportunities for students to engage in the practices of science and engineering; these should be assessed through a variety of modalities.

MORE INFORMATION: <http://www.nsta.org/conferences/national.aspx>

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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.



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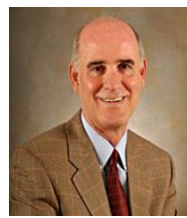
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Science Education International
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