

JAN-FEB 2013

Welcome to the ICASE Jan-Feb 2013 Newsletter !

The ICASE Newsletter is a regularly distributed 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 chldren and young people throughout the world. Today, ICASE is a huge network of science education associations, institutions, foundations and companies, facilitating communication and cooperation at the regional and international level.



International Council of Associations for Science Education

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ICASE News



Jack Holbrook, ICASE Project & Secondary Journal

ICASE Executive Meeting

Linked to the ICASE workshop and seminar In Bangkok in December 2012, the ICASE Executive met to reflect on developments. The minutes documented 9 Executive members were present.

The meeting considered a range of aspects. Some are highlighted below:

- 1. The ICASE award for outstanding contributions to international science education was awarded to Robin Groves recognizing a variety of contributions, especially the 2007 ICASE world conference. Also discussed was whether to reassess criteria for the award.
- 2. Any recommendation to change the ICASE Constitution needed to be identified by February 2013. One consideration here was whether to re-consider an ICASE executive secretary, as was the case in the past. An executive secretary would be an honorary position on the ICASE Executive as a non-voting member of the committee.
- 3. The committee welcomed new members of the Executive these are: A.Christine McDonald, ASTE, elected as regional representatives for Australia- Pacific region.
 - B.Devadason Robert Peter, SEAMEO RECSAM, elected as regional representative for Asia.
 - C. Lindsey Connor, NZASE, elected treasurer to replace Peter Russo.
 - D. Steven Sexton, NZASE, appointed as the chair of the Primary Science standing committee.
 - E. Janchai Yingprayoon, Science teacher's Section, Sc Soc Thailand, appointed chair of the ICASE Science Centres standing committee.
 - F. Miia Rannikmae, EACT, appointed chair of the University Links standing committee.
 - G. Jack Holbrook, Immediate Past President took on the chair of the Secondary Science standing committee.
- 4. Reflected on the need to get SEI in ISI web databases. Also considered changing editorial board, while keeping journal at a high academic level so as to attract more University ICASE members.
- 5. Considered a proposal to publish ICASE books on (a) inquiry-based science education (b) 40 years of ICASE.
- 6. Considered the role of ICASE in the World Conference in Kuching. ICASE Executive suggested running symposia on suitable topics.
- 7. Considered the General Assembly at the World Conference when any constitutional changes would go before the Governing Body, the ICASE member organisations. Also new officers are elected at this time.
- 8. Discussed a position paper for STE centres for discussion and approval for operation under the standing committee: related to the criteria geared to operation and quality.
- 9. Reflected on a position paper for ICASE projects, to be developed under ICASE centres. Importance of project criteria stressed as per past project developments.
- 10. Review the ICASE implementation plan to ensure realistic priorities set for 2013-2014.



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Inaguration of ICASE STE Centres





Plaques being presented to Janchai Yingprayoon for the Centre in Bangkok, Thailand and to Noel Brett (on behalf of Declan Kennedy) for the centre in Cork, Ireland. [These centres join the existing Centre in Guilin, China ran under Prof Luo.]

Aim of ICASE Science and Technology Education Centres (ISTECs)

The aims of ISTECs are to enable ICASE to better impact on STE worldwide. In striving towards this impact, the ISTECs standing committee intends to play its role in supporting the ICASE mission and strategic plans of ICASE and, in particular, enhance the ICASE role of undertaking leadership in the STE arena, provide professional development opportunities for science teachers and educators and, by running projects, ensure ICASE is able to fulfill its desired goal of promoting excellence and global coordination in STE.

The ISECs standing committee intends that each ISTEC meets this aim (with the help of ICASE members) by:

- identifying professional development needs and practices for teachers of science and science educators, with particular reference to 21st century views on 'education through science';
- 2. undertaking professional, high quality, development of teachers of science and science educators with a focus on three ICASE/ISTEC projects (primary engineer; motivational STE; popularization of science.
- 3. promote innovative science and technology teaching strategies and philosophical concepts, curriculum initiatives, developments and policies, advances in education systems including those of science education in informal settings, as well as materials and resources for science teaching geared to ICASE/ISTEC projects;
- 4. disseminating coordinated research in STE, especially where this impacts on classroom science teaching and learning related to ICASE/ISTEC projects;
- 5. raising awareness of methods of exchange to maximizing input, sharing, networking and continued communication in science education between ISTECs and others worldwide;
- 6. initiate and run ICASE.ISTEC projects; and
- 7. enact and promote further activities stemming from ICASE standing committees, ICASE regional representatives and ICASE member organizations.



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ICASE Workshops - Bangkok 2012



Dr Bulent Cavas, chair ICASE Publications Committee running a workshop on robotics in science teaching. The activity is related to a project worksheet on Traffic Accidents and the role of robots. It explores an inquirybased approach to science teaching.



Noel Brett running a workshop on datalogging in science. The participants were introduced to datalogging using a PROFILES project worksheet from University College, Cork. The worksheet focuses on inquiry-based science education.





A third workshop by Miia Rannikmae, ICASE chair for University links, explores inquiry based science learning through the use of microscale kits. Again the approach is based on a project worksheet, this time on the subject of smells.



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ICASE Seminar on Education for Sustainable Development



Seminar participants



Dr Krongthon Khairiree



Dr Janchai Yingprayoon

This seminar, organized by Dr Janchai Yingprayoon, ICASE Chair of Science and Technology Centres Standing Committee, with kind permission of Dr Krongthon Khairiree, focused on Education for Sustainable Development within Science Education. Presentations were made on science education developments in various countries that impact on education for sustainable development. Of interest are considerations on whether ESD and STL (scientific and technological literacy) are both the same major focus within science education. Readers are invited to comment.



ICASE sincerely thanks ASE for providing space for the ICASE booth at their annual event!

To further promote the ICASE World Conference to be held in Kuching, Malaysia at the end of September 2013 and to begin dissemination of ICASE teaching materials through its involvement in a European Science in Society project, ICASE set up a booth at the annual Association for Science Education meeting in the UK, January, 2013.



A flyer on the World Conference and a copy of ICASE / UCC PROFILES Newsletter and details of ICASE / UCC PROFILES Resource Material were given to each visitor. Chocolates were also available on the stand!



James Levis and Una Leader, ISTA, gave great assistance to Declan Kennedy, ICASE Europe Representative, in manning the stand.



Pre-Secondary and Informal Science Activity: Swimming Fish.

Steven S. Sexton

Chair, ICASE Pre-Secondary and Informal Science Standing Committee

Preamble

It is hoped that this is the first of several activities planned to support pre-secondary and informal science in primary/elementary/ECE classrooms. As this is the first in the series, some explanation is offered as to why this series has been planned. Further activities in subsequent newsletters will not have such a long introduction.

Many teachers are reporting a lack of content knowledge as the reason behind less science being included in their teaching programmes. This is compounded by many teacher curriculum documents having explicit directives to incorporate student initiated topics in their teaching. As an initial teacher education lecturer and facilitator of professional development in science education, I hear far too many primary teachers saying that they do not have the background knowledge to effectively teach science.

Teachers' self-imposed content knowledge limitations in science, compounded with perceived lack of resources for science, results in many students not experiencing effective learning of science. Duschl, Schweingruber and Shouse (2007) noted that many of the key ideas of and about science may, in fact, be impossible without instructional support; that is, the classroom teacher. They reiterated that for science learning to successfully engage students, it must be meaningful to them and they must be supported by the teacher. Let's be very clear here, teachers are not trying to be scientist, or somehow turn their students into scientist. Teachers need to provide effective, educationally sound, learning opportunities in the area of science.

What counts as quality and effective science in schools has been highlighted (Education Review Office, 2012). New Zealand's Education Review Office (ERO) highlighted the characteristics that were evident in the classrooms in which effective education through science was taking place. In these schools, their students like doing science; are motivated by their classroom science activities; think they are learning well in science; and are enthusiastic about doing more science.



The Concern

This 'Swimming Fish' activity was taken from the ICASE website

(http://www.icaseonline.net/pdf/CONFPACK.PDF, see page 9).

I would argue that while this activity is perfectly suitable as a pre-secondary and informal science activity for young students, it needs to be taken further than what was originally included. Students do need to experience the "WOW" factor of science, but without the corresponding "Why this happens" discussions; these experiences are more likely to be seen as fun by students, as there may be no real learning involved. The questions generated about how, why, what if and what about, as they seek deeper understanding about the science lead to further and more meaningful investigations in the science. This is what most likely offers the challenges which students might think they already knew.

Students need to be explicitly asked to explain their explorations. There needs to be the deliberate step of discussing what they did and why, and what were the results of what they tried. Positive learning effects have been seen in students who use discussions as a key part of the science process (Duschl & Hamilton, 2011). The students are given the opportunity to talk about the science. This deliberate communicating in science allows the teacher to actually hear what students are thinking and how they are making sense of the science.

The activity

As an activity this requires nothing more than a container of water, large enough to allow students to watch the movement of the fish; any piece of paper; some cooking oil and a straw/dropper. For very young students, it may be necessary for the fish to be pre-cut. Once the materials have been gathered, let the students explore what happens when oil is dropped into a fish that has been placed on the surface of the water. Students who submerge their fish only add to the experience of what happens. Students need to observe what happens and discuss what and why they think is happening. What do they see happening? What do they think is happening? How are they making sense of why the fish moves across the water? Just as important, the students need to do this more than once and almost without fail, will ask what happens if they make their fish out of something besides the paper that they have used.



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As stated, we as teachers, are not trying to turn our students into scientists, but we are trying to get them to think and act like one. As such, scientists ask questions and then try to find ways to answer them. Students learn that their science activities are not just one-offs with no connection or meaning to the next, and that when they have questions, they are likely to get the opportunity to try and answer them. We, as teachers however, do have to work within the constraints of the day and timetables, but students do need to learn that they may not get all their questions answered.







As the photos show, while I replicated this activity with three different materials (plain white paper, card paper, and cardboard), there was no need to replace the water each time. Only after several goes, will this be necessary. As the fish material changes, the distance the fish



travels changes, along with the amount of oil it takes to move the fish. To give the students a better understanding of what is occurring; it may be helpful to lightly sprinkle flour/fine ground pepper onto the surface of some water and then drop some oil into the centre to allow the students to see what happens. Similarly, a drop of detergent into the oily water produces the same effect and prepares the activity for these activites.

http://www.ehow.com/how-does_5452223_detergent-break-surface-tension.html.

Teachers do need to understand that while you do not need to know every answer you do have the right to say, 'I don't know.' However, as the responsible adult in the classroom, you should model the students as to how to find the answers.

References

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- Duschl, R. A., Schweingruber, H. A., & Shouse, A. W. (Eds.). (2007). Taking science to school: Learning and teaching science to grades K-8. Washington, D.C.: The National Academies Press.
- Education Review Office. (2012). Science in the New Zealand Curriculum: Years 5 to 8. Wellington, New Zealand: Education Review Office.



FuLL Science Project

Assoc.Prof.Bulent Cavas, ICASE Publication Committee Chair

The "FuLL-Science (have fun with science, love science, and live science)" Project is a funded FP7 Project which aimed at ensuring the understanding of science and technology by the society offering innovative scientific and technological learning opportunities such as seminars, demonstrations, panels, competitions etc. from elementary education level to Adult education level as well as the people who drop out education. The FuLL-Science project is confident to reach this aim by promoting the following actions: The first approach (Have fun with science) is to help participants "have fun" with science. We planned to organize various activities, such as games, animations, entertainments, workshops, plays, theatres, music, dance, etc. that meet the participants in all ages with the amusement in science. We wanted to illustrate how science is enjoyable by a mix between science and art, theatre, and literature. The second approach (Love science) is to introduce the participants with the "love" part of the science, which we conceived as how scientists fell in love with science, and thanks to this love how they become productive in their respective fields and how scientists are ordinary people who are also have hobbies. That is, we would like to help the participants to recognize the scientists and their work by presenting them opportunities to meet with scientists and their studies. The third approach (Live science) is to assist the participants be acquainted with how they "live" science in their daily life. For example, we presented them opportunities to see how science is in our life, to experience the science in daily life by hands-on and minds-on activities, and to shape their view of science as a way of knowing. The participant also realized the scientific developments in various fields by meeting and discussing with scientists. This action provided strong scientist guidance to assist in removing possible obstacles and to build up confidence that the Scientists are regular people like us. The activity was held in Izmir International Fair on September 28, 2012. These activities were attended by 5500 visitors. Approximately; 3500 participant visited outdoor area of Atlantic Hall, 3500 were indoor area of Atlantic Hall, 500 were Izmir Art Centre, 1000 were Ismet Inonu Art Centre, 250 Celal Atik Sport Centre, and 65 SASALI Natural Life Park.



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Chemistry Education Research and Practice (CERP) Call for submissions

2014 CERP special themed issue on Physical Chemistry Education Scheduled for publication in July 2014

Guest Editors

Georgios Tsaparlis (1) and Odilla E. Finlayson (2) (1) Department of Chemistry, University of Ioannina, GR-451 10 Ioannina, Greece (2) School of Chemical Sciences, Dublin City University, Dublin 9, Ireland.

CERP is the peer-reviewed journal for teachers, researchers and other practitioners in chemistry education, published by the Royal Society of Chemistry (RSC). CERP is an open access journal, available at <u>http://www.rsc.org/cerp/</u>. CERP is sponsored by the RSC's Education Division as part of the Society's educational mission, and no administration or page charges are levied on authors publishing in the journal.

Call for contributions: Physical Chemistry Education

Topics for contribution may include but are not limited to:

- The abstract nature of physical chemistry
- Conceptual understanding in the various sub disciplines of physical chemistry
- Concept learning versus mathematical approach to physical chemistry
- Assessment of physical chemistry testing for conceptual understanding or mathematical manipulation
- Mathematical coverage and mathematical rigor: how much and how far?
- Problem solving related to physical chemistry
- The physical chemistry laboratory
- The physical chemistry curriculum
- The role of the textbook in teaching of physical chemistry
- The interface of physical chemistry with the other branches of chemistry or with other disciplines biology, physics, technology, geology, medicine, etc.
- Physical chemistry in context
- Computational chemistry
- Use of symbolic mathematics engines for data analysis, model building, and problem solving
- Computer simulations and online learning in physical chemistry.
- Physical chemistry concepts and topics as part of general chemistry courses at second and third level
- Reviews and Perspectives (including historical perspectives)

Contributions should align with the principles and criteria specified in the recent CERP editorial (Chem. Educ. Res. Pract., 2012, 13, 4-7). To summarise, there is a requirement that papers provide an argument for some new knowledge supported by careful analysis of evidence; either by reviewing the existing literature, analysing carefully collected research data or rigorously evaluating innovative practice.

Submission of Manuscripts

Manuscripts should be submitted in the format required by the journal using the ScholarOne online manuscript submission platform available at http://mc.manuscriptcentral.com/rp. Enquiries concerning the suitability of possible contributions should be sent directly by email to: Georgios Tsaparlis: gtseper@cc.uoi.gr and/or Odilla Finlayson: Odilla.Finlayson@dcu.ie



22nd Symposium on Chemistry& Science Education, held at the University of Bremen, 19-21 June, 2014

Science Education Research and Education for Sustainable Development

This symposium continues a long tradition stretching back to 1981. In 2014, the symposium will coincide with the end of the United Nations worldwide Decade of Education for Sustainable Development (DESD) spanning from 2005- 2014. Past Dortmund-Bremen-symposia on science education have focused the question of how science education research can help to improve chemistry and science teaching and learning, and also the objectives to be followed.

In recent years, debate on the challenge of sustainable development of our future added another dimension towards this discussion. This additional focus and the coinciding with the end of DESD provoked the symposium organizers to entitle the 2014 symposium: "Science Education Research and Education for Sustainable Development (ESD)."

This title simultaneously maintains and further develops many topics of past symposia from 2002-2012, in which we discussed the orientations and directions of science education research, questions of contemporary and successful science learning, and the role of research in science teacher education. The symposium in June 2014 will reveal and evaluate all these aspects even more in connection with goals and strategies focusing Education for Sustainable Development within science education.

The main questions addressed will include:

- What does science education research revealed about students' and teachers understanding of sustainability issues and ESD?
- Which curricula and pedagogies are available to strengthen ESD in science education at the secondary and tertiary level and what do we know about their effects?
- What do we know from research about fostering factors and constraints concerning the implementation of science education through an ESD approach?
- What do we know about attitudes, motivation and PCK of practicing teachers concerning sustainability issues and ESD in science teaching?
- How is science teacher training for ESD (pre- and in-service) developed and what do we know about the development of teachers competencies in successfully applying ESD in science classes?
- What research-based strategies exist for implementing ESD thoroughly into chemistry and science teaching by fostering science concepts simultaneously?
- What consequences does the interdisciplinary nature of most sustainability issues has for chemistry and science education?
- Which role might the informal and non-formal educational sector play to support ESD?

All contributions will be presented by invited lecturers and poster presenters. Suggestions for appropriate lectures and posters are welcome up to April 2014.

Venue: University of Bremen, Dep. of Chemistry, Leobener Str. NW2, D-28356 Bremen, Germany.
Conference chairs: Prof. Dr. Ingo Eilks (Bremen) and Prof. Dr. Bernd Ralle (Dortmund).
Contact address: Prof. Dr. Ingo Eilks, University of Bremen, Department of Biology and Chemistry, IDN, Leobener Str. NW2, D-28356 Bremen, Germany, *ingo.eilks@uni-bremen.de*Further information: http://www.chemiedidaktik.uni-bremen.de/symp2014/index.html from January 01, 2013.
Conference fees: None. Travel costs, accommodation and social events are the responsibility of the participants.

A second announcement will follow in autumn 2013. For more information see the conference website.



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Science Education Research and Education for Sustainable Development (ESD)

22nd Symposium on Chemistry and Science Education to be held at the University of Bremen, June 19-21, 2014

(First Announcement) www.chemiedidaktik.uni-bremen.de/symp2014/ Conference dates: June 19 - 21, 2014

Conference language: English

Venue: University of Bremen, Dept. of Biology and Chemistry building, Leobener Str. NW 2, 28334 Bremen, Germany

Conference fees:

None. Travel costs, accommodation and social events are the responsibility of the participants.

Conference chairs:

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Further information:

Current information will be published at *www.chemiedidaktik.uni-bremen.de/symp2014/* from January 2013.

A 2nd announcement will follow in Autumn 2013.



ICASE Executive Committee 2011-2013

The ICASE Executive Committee is persons who make decisions on behalf of the ICASE Governing Body. The ICASE Governing Body is the **ICASE member organisations**.



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For more information about ICASE Executive Committee, please visit the ICASE Website <u>www.icaseonline.net</u>