International Council of Associations for Science Education

Supporting and promoting science education internationally
The ICASE Newsletter

MAY 2012

Welcome to the ICASE May 2012 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

http://www.icaseonline.net

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Science Education International

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

Contents of Newsletter

Editorial;
Jack Holbrook
ICASE Past President
jack@ut.ee

Bulent Cavas
Publications Committee Chair
bulentcavas@gmail.com

ICASE News

Jack Holbrook, ICASE Past President

Call for papers: Special edition of Science Education International: Future Directions for Inquiry based Science Education (IBSE)

Guest Editor: Dr Peter Gray, Norwegian University of Science & Technology and the S-TEAM project

Deadline for abstracts: 15th May 2012

Inquiry-based science education has been the focus of several EU-funded projects in recent years, and is also visible in national education policy, and elsewhere. It is seen as the answer to problems of student disengagement from science and to possible shortages of science graduates in the future.

These projects and policies are now at a crossroads. Much has been learned about implementing IBSE, there has been positive feedback about its results and acknowledgement of the role of systemic change in making better use of IBSE. This special edition of SEI will focus on future directions in IBSE. Some possible themes might be:

- Creating coherent policies for IBSE – how can pedagogy, curriculum and assessment work together to promote inquiry based methods?
- Research in IBSE – is it possible to produce definitive answers as to its effectiveness, is further research required or do we know enough? If we need further research, what would such studies look like?
- Teacher professional development vs. teacher professional learning – how should the principles of inquiry be applied to/by teachers themselves, in their own development activities?
- Resources for IBSE – has a European focus on resources for teachers been at the expense of the empowerment of teachers to create their own?
- What are the possibilities for using vicarious learning with rich media to support inquiry in future science classrooms?
- Moving from closed to open inquiry – what are the limits?
- Is IBSE the answer and if so, what was the question?

We invite contributions not only from IBSE projects and their coordinators but also from teachers, teacher educators and policymakers involved in implementation. Articles should not be descriptive reports of IBSE implementations but should critically reflect on the opportunities for, and barriers to, effective implementation of IBSE. Current references to research literature would be useful, but it is not necessary for articles to report research studies themselves, unless these are exceptionally significant.

Abstracts of between 400-600 words should be sent to Dr Peter Gray graypb@gmail.com by 15th May. Authors will receive comments and a decision by 15th June, and the deadline for draft articles of between 4-6000 words will be 15th September 2012. A template and submission guidelines will be sent to successful authors with editorial comments.

DEU-ICASE Collaboration for PROFILES Project

The science and technology teachers from Izmir-Turkey are implementing PROFILES modules in the classroom. The students are working as a team to solve a socio-scientific issues. The two PROFILES modules entitled"how traffic accidents can be eliminated using robots" and "How Happy are You and Your Family with the Electricity Bill?" were used. The students are motivated to investigate the socio-scientific problems in the modules. In the next issues you will find more details on the implementation of the modules

The ICASE materials on the website of the Kyrgyz Academy of Education

From May 2012, ICASE materials for science teachers will be translated into Russian and posted on the web-site of the Kyrgyz Academy of Education (http://www.kao.kg/). This initiative was launched by a doctor of pedagogical sciences, Mambetakunov Ulanbek E. (umambetakunov@gmail.com). Ulanbek suggests that as science teachers are teaching the same laws, theories and principles, a more unified approach to the ways of teaching can be considered. Also he suggests Kyrgyz teachers would like to be able to read the leading ideas of science teachers of the world.

The ICASE World Conference Flyer

ICASE flyers for the World Conference on display at the annual meeting of the Irish Science Teacher Association (ISTA).

An updated version of the flyer is elaborated below. For copies contact Elaine Horne on Elaine.Horme@dec.wa.gov.au

Training the next generation of "Night Scientists"

by Eva-Maria Schötz and Francois Taddei

"Night science wanders blind. It hesitates, stumbles, recoils, sweats, wakes with a start. Doubting everything, it is forever trying to find itself, question itself, pull itself back together. Night science is a sort of workshop of the possible where what will become the building material of science is worked out."
—François Jacob, *Of Flies, Mice and Men*

A report on a workshop introducing 'night science'
The Center for Research and Interdisciplinarity (CRI), in an attempt to bring together those who innovate in science education, invited about 30 international innovators to Paris in the summer of 2011. The workshop brought together a group of innovators who have independently introduced novel concepts in science education. This report summarizes some of the ideas and new initiatives put forward at the workshop.

Hands-on Experiments
Hands-on Research Schools (http://handsonresearch.org), co-founded by one of the keynote speakers at the conference, demonstrate how inexpensive table-top science can address cutting-edge scientific questions. The centerpiece of the schools, which are designed for early-career scientists from developing countries, is daily laboratory sessions on chemical, physical, and biological problems as published in leading scientific journals. Participants learn to exploit inexpensive consumer hardware such as web cameras and the open source Arduino microcontroller. Many biological problems are well-suited for a table-top approach and are readily adapted to address important problems of local interest, such as Schistosoma mansoni in a previous school in Africa.

Training sessions for the participants included mathematical modeling and data analysis skills using software such as MATLAB, which is widely used in industry and academia. The Hands-On Research Schools have been sponsored since their inception in 2008 by the UNESCO-administered Abdus Salam International Centre for Theoretical Physics (ICTP; www.ictp.it) in Trieste, Italy.

Citizen Science and Crowdsourcing of Research
Using analogies to chess champion Gary Kasparov's experiences with man-computer collaborative and "crowd sourcing" chess, the workshop host emphasized that integrating technology and citizen science allows new generations of students to become engaged as critically thinking citizens, able to tackle the multifaceted 21st century challenges.

Crowd sourcing, as a means to boost innovation in academic biomedical research programs, was shown to lead to significant improvements, covering an unexpectedly broad spectrum of possible effective solutions, which could be provided by non-scientists, and realized rapidly and cheaply. The Citizen Cyberscience Centre also engages citizens in contributing new research ideas, especially for humanitarian projects in developing countries. Concrete examples include the Computing for Clean Water project, which helps scientists to design efficient low-cost water filters for clean water, and UNOSAT, which encourages citizens to help improve damage assessment data for Libyan cities by geo-tagging Web images of damaged buildings. Two different approaches to the teaching of evolution and natural selection, as well as engaging the public directly in evolution research, were introduced: Picbreeder allows web users to collaboratively evolve images over many generations, echoing the process of natural selection, while BreedBot allows users to breed a population of simulated robots under natural or artificial selection, with the goal of testing the evolved controller on real robots.

Scientific Discovery and Adaptive Learning through Games

Games were suggested as perhaps the ideal framework for creating a symbiotic human-computer problem-solving architecture for solving scientific and educational problems. Emphasized was the importance of games to improve science education, particularly in basic mathematics and physics.

Using the protein folding game *Foldit* as a concrete example to describe efforts towards scientific discovery games, multiple methods of engagement to evolve novice citizens into state-of-the-art researchers was introduced.

Another example of that kind was *EteRNA*, an online RNA design game, which is unique in integrating high-throughput biochemistry. It was argued that citizens can contribute to scientific progress by presenting their creativity and intuition in a structured form. A game in which students play with simulated DNA structures on a computer and then recapitulate their exploration in a hands-on way is being developed with actual “magnetic bases" mimicking DNA-origamis. “Biotic games” allow a human player to interact in real time with live biological systems, such as single celled Paramecia in an electric field, to play a Pac-Man-like game. Also demonstrated was how the game of Mastermind, a simple logic game in which the goal is to break a secret code using repeated rounds of experiment-result-interpretation-design, can be used to reinforce scientific concepts such as the importance of controls, the power of negative data, and the dangers of over-interpreting one’s results.

Post- Workshop Initiatives

To follow up and achieve a global impact, the following initiatives for a science "co-opetition" and a science wiki-website, was conceived for everybody to engage in ***night science.***.

The Night science co-opetition

This is an international contest of new ideas for engaging citizens in scientific research (www.nightscience.org). Teams of participants, working with the guidance of a professional scientist, can either accept a targeted challenge, proposed by the organizers, or propose their own project in one of three open categories:

(1) Learning by playing: teams are invited to propose new scientific discovery games that allow players to contribute to research,

(2) Learning by doing: teams can propose new hands-on experiments that are cheap to perform and relevant scientifically,

(3) Learning by questioning: teams are invited to propose new “Socratic technologies”; the challenge here is to invent technologies that can foster learning via the Socratic method.

The spirit of the contest is *open source*, i.e., all ideas proposed by participants will be disseminated under a Creative Commons license to allow anyone to share, and further develop ideas for the benefit of all.
Another important dimension of the contest is described by the term "co-opetition," which describes a competitive-collaborative hybrid and means that everyone is encouraged to build on and improve the ideas of others.

Every team will document their progress on a wiki page, and all participants can contribute to the ideas they find the most relevant. During the co-opetition, participants will be able to get help from professional scientists, and the contest winners will be offered an opportunity to develop their ideas further in one of the leading labs in the world.

Web resource initiative

The workshop participants agreed to launch a website that covers a comprehensive spectrum of education resources, related to:

- low-cost table-top experiments,
- freeware programs,
- educational games,
- lecture demos,
- science blogs,
- interesting homework assignments,
- free online textbooks/courses,
- relevant papers published in Science education page,
- links to other education websites and funding opportunities.

While these categories are broad, they can all be thought of as individual, unique "teaching (and/or) science nuggets". They should represent the most fun, successful, inspired and inspiring, spark-inducing, love-for-science generating moments from the educators' careers; moments they would have wanted to experience when they were students, and the ones they would hope for their children to experience in the classrooms of today and tomorrow.

Although many of these topics are served by existing online sites, to our knowledge there is no single resource that covers them all—a kind of Wikipedia of science education. The plan is to fill this gap and create a website that provides educators at all levels with a toolkit for cutting-edge science education, something that is especially lacking in developing countries.

This website is clearly a grand challenge and cannot be created, maintained, and updated by only a few individuals, thus it must become a community-driven project with content created and uploaded by users. We are designing the site to be a highly cross-referenced, easily searchable database, in which novel educational techniques will be tested and evaluated by the worldwide science education community.

A full-length version of this newsletter with more information on the workshop, the website and the competition, and relevant references related to the workshop can be obtained from FrancoisTaddei (taddei.francois@gmail.com) or Eva-Maria Schötz (emschoetz@gmail.com).

General Safety Practices for the Science Classroom

James A. Kaufman, Ph.D. Chair, ICASE Committee on Safety in Science Education
International Council for Associations of Science Education

The committee on safety in science education would like to ask the ICASE Newsletter readers for their Top Ten Health and Safety Precautions in science education from two perspectives:

(a) the students and
(b) teachers.

We would like to invite readers to submit their lists to the committee chair. Of special interest are precautions being advocated by teachers in developing countries. Do you really, really advocate safety goggles ? (if you do where does the money come from?)

Consider the list below of 10 best (?) reaons for NOT considering safety when undertaking science edcuation lessons.

The Ten Best Reasons (??)

1. I've never had a problem.
2. I've been working here 17 (more or less) years and nothing has ever gone wrong.
3. It can't happen to me.
4. You're overstating the risk.
5. We don't have to worry about that.
6. I have a Ph.D. and Post-Doctoral experience in this. What's your background?
7. You'll feel differently about it when you're older.
8. I'd rather do it my own way.
9. This is the way it has been done at my institution.
10. Everyone does it this way.

The ten best reasons for not following safety rules and procedures are really just excuses for doing something they way you want to do it. What are your "reasons"?

Calendar of Events

Welcome to the World Conference on Physics Education

We are looking forward to seeing physics educators, teachers, researchers, and policy makers from around the world at this very first World Conference on Physics Education

Date: July 1-6, 2012

Venue: **Bahçeşehir Üniversitesi, İstanbul / Turkey**
Çırağan Caddesi, Osmanpaşa Mektebi Sokak, No: 4 - 6
34353 Beşiktaş, ISTANBUL, TURKEY

The conference was initiated by **Groupe International de Recherche sur l'Enseignement de la Physique (GIREP)** and the **International Commission on Physics Education (ICPE)** – Commission 14 of the **International Union for Pure and Applied Physics (IUPAP)**. It is being sponsored by **GIREP**, **ICPE** and the **Multimedia in Physics Teaching and Learning (MPTL)** group and endorsed by **American Association of Physics Teachers (AAPT), Latin American Physics Education Network (LAPEN)** and the **Asian Physics Education Network (AsPEN).**

The vision for **2012 World Conference on Physics Education** is to follow a global participative process before, during and after the conference. The Conference will be structured to help foster collaborations on physics education research and development which can transcend national boundaries. The goal will be reached through working sessions which will develop actions plans that strengthen the teaching and learning of physics at all levels and in many countries.

The 2012 World Conference on Physics Education will be a concrete step forward in global cooperation. Envisaged as a series of conferences with a four year periodicity, it would be a working conference with follow-up actions that presumably would carry over to the following conference.

XV IOSTE INTERNATIONAL SYMPOSIUM

Yasmine Hammamet – Tunisia – 29 October – 3 November, 2012

We are pleased to invite you to participate in the XV IOSTE International Symposium on **Science & Technology Education for Development, Citizenship and Social Justice** to be held at Yasmine Hammamet (29 October – 3 November, 2012).

The conference is organized by EDIPS / ISEFC in cooperation with **UVT, DISEMEF, FSB, CENAFFE, ATDSVT, ATDM**, and other institutions and associations *(see below the meaning of these acronyms).*

IOSTE XV is an International Symposium for researchers to present research papers, workshops, posters and explore collaboration with other researchers in the fields of Education and Research. Our aim is to inspire and provoke meaningful discussions and debates.

IOSTE XV will include a diverse and comprehensive program covering a number of areas of science and technology education (teaching, learning, practice, development, innovations, evaluation,..). The program will also include a wide range of activities designed to facilitate the exchange of expertise, experience, and resources amongst researchers, educators and trainers.

The IOSTE XV will be held in **Yasmine Hammamet**, a city in the North-East part of Tunisia. The event will bring together scientists, technologists, teachers, trainers, education inspectors, policy makers and graduate students from across the globe to promote discussion of issues relating to the theme and sub-themes.

Early Registration Fees	**Late Registration Fees**	**Symposium dates**
Before July 31, 2012	After July 31, 2012	October 29 - November 3, 2012

SUBMISSION:
You can propose:
A single oral communication (a slot of 30 minutes, including 10 minutes of discussion)
Coordinated interventions during a slot of 90 minutes: mini-symposium or round-table, with authors coming from at least two countries
A poster, which will be visible during all the symposium; it will be orally presented and discussed during the posters' sessions

- Each participant can be first author for only one proposal (one oral communication, or round table / mini-symposium, or poster). He / she can be co-author of several other proposals.
- Each first author must present the communication (or the poster).
- **For each proposal, you have to choose one of the nine strands, and to submit an abstract and a 3 pages synopsis only, or an abstract plus the full paper**.
- Each proposal will be pair-reviewed. The proposal's originality, its relationship to the conference theme and the clarity of its objectives, organization and approach are factors considered in selection.

The form for abstract can be uploaded from http://www.inedp.org/ioste-XV and will be sent by email (iosteXV@gmail.com) or through the online submission system by March 1, 2012. **Please note that submissions must be made through the online submission system and by email at the same time.** (To facilitate file management, please use the following system to name your file: YourSurname_Country.doc or YourSurname_Country.docx or YourSurname_Country.rtf)
Accepted proposals will be included in the Symposium Proceedings, only after reception of the registration fees of the first author.
The deadline for the full paper submissions is July 1, 2012. It will be peer reviewed. The guideline for the presentation of the full papers is joined below.
For further details on the symposium, please visit our website: http://www.inedp.org/ioste-XV

I, on behalf of **IOSTE / EDIPS / DISEMEF / ISEFC / UVT** and cooperating partners, feel honored to be hosting the conference in Tunisia. We look forward to seeing you at the conference.
IOSTE *(International Organization for Science and Technology Education);* ***EDIPS*** *(Research Laboratory of education, didactics and psychology: Laboratoire de recherche en éducation,* didactique *et psychologie));* ***ISEFC*** *(Higher Institute of Education and Continuous Training*: *Institut Supérieur de l'Education et de la Formation Continue);* ***UVT*** *(University Virtual of Tunis: Université Virtuelle de Tunis);* ***DISEMEF*** *(Ecole doctorale "Didactiques, Sciences de l'enseignement, Métiers de l'Education et de la Formation");* ***FSB*** *(Faculty of Sciences, Bizerte) ;* ***CENAFFE (****Centre National de Formation des Formateurs en Éducation de* Tunisie*);* ***ATDSVT (****Association Tunisienne de Didactique des Sciences de la Vie et de la Terre);* ***ATDM*** *(Association Tunisienne de Didactique des Mathématiques).*
Kind regards,
*Mondher****ABROUGUI,***
Contact: *abrouguimondher@yahoo.fr*
EDIPS - ISEFC - University Virtual of Tunis Chair, Local XV IOSTE Symposium Organizing Committee
Website URL: *http://www.inedp.org* ***Direct URL:*** http://www.inedp.org/?conference=ioste-XV
Organizing Committee Email: iosteXV@gmail.com

The THEME: "Science & Technology Education for development, citizenship and social justice" is expressed through **9 Strands (S1 to S9):**

S1: **Education for Sustainable Development, Human Rights and Health**.
Suggested topics
- Education for all. - Citizenship education. - ESD (Education for Sustainable Development) / Environmental education.
- Health education/ health promotion/Sex education. - Ethics in STE

S2: Cultural, social and gender issues in STE
Suggested topics
- Gender issues. - Values and Ethics in STE. - International comparisons. - Student diversity and inclusive education.
- Political issues in STE. - Indigenous Knowledge and Intercultural Education. - Language problems / linguistic diversity
- Conceptions, science, justice and citizenship - Science, Technology and Society.

S3: STE and religion.
Suggested topics
- Nature of science, nature of religion. - Science education versus religious education
- Science and religion: strategies for learning and teaching, teachers training, curriculum design.
- Science and Belief: alternative conceptions. - Teaching religions or enrolling in a religion? Inside or outside school?

S4: ICT for equity and democracy in STE.
Suggested topics
- Digital divide. - ICT and e-learning in teacher development. - Smart school and ICT-based education.
- Distance learning and blended learning. - ICT learning and instructional design.
- Perspectives and educational programs beyond ICT

S5: Epistemology, History and Philosophy in STE.
Suggested topics
- History and epistemology in mathematics, fundamental and applied sciences
- History and Philosophy of Biomedical and Health Education. - Philosophy of Science: Modeling, complexity, prediction

S6: Socio-scientific issues in STE.
Suggested topics
- Socio-scientific issues and cognitive process in formal and nonformal learning - Using Socio-scientific issues for STE
- Education in science centres and museums - Positioning arguments and controversies in STE

S7: **Teacher training and teaching practices**
Suggested topics
- Teachers and trainers in science and technology: Policy, missions, training, roles, values and perspectives. - Teaching STE versus conception and competence - STE: Practices and didactic design

S8: Curricula, textbooks and media in STE
Suggested topics
- Critical analysis of official programs and textbooks. - Curriculum design and development in STE.
- Inter/intra / trans-disciplinary topics. - Science, Media and Society

S9: Evaluation in STE.
Suggested topics
- Assessment and ranking of schools and universities. - Assessment dealing with learning, training and citizenship education
- Competency assessment. - Social impact of assessment. - Theory and practice of Assessment, Evaluation, Testing and Measurement. - Evaluation of Educational Research. - Educational Assessment Policies and System Monitoring.
- International comparative evaluations (PISA, TIMMS, ROSE,…)

World Science and Technology Education Conference

Following similar conferences in 2003, 2007 and 2010, the International Council of Associations of Science Education holds the next World Conference on Science and Technology Education

Sunday 29 September - Thursday 3 October, 2013

Borneo Convention Centre, Kuching, Sarawak-Malaysia

http://www.icase2013.org

The theme of the conference, 'Live Science, Love Learning, Create Change', addresses contemporary issues of importance to Science Teacher Associations, Science Centres, science teacher educators as well as both students and teachers as we move into the second decade after the millennium.

"Live Science" – encourages ICASE member Science Teacher Associations and Science and Technology Education Centres to recognize that science is more than just a subject at school, to impact knowledge and skills adopted from yesterday's approaches. The promotion of science education as interdisciplinary learning is a vital step toward promoting students' acquisition of 21st Century skills not only for sustainable and responsibly citizenship but for a career in an increasing science and technology driven world society.

"Love Learning" – focusses on the role of the teacher, and hence considerations for Science Teacher Associations and Science and Technology Education Centres, not only to guide students to want to participate and acquire the knowledge and skills for tomorrow's society, but that students' own self-motivation is a necessary and key factor in embracing science education as a crucial component of learning.

"Create Change" - deals with the role of Science Teacher Associations, Science and Technology Education Centres as well as teachers themselves in using science education at every level as a way of shifting the mindset on meaningful sustainability, from merely 'talking about' best pedagogical practices to 'undertaking' them, creating a generational change in student attitudes and values towards science and school and the role of leanring through science lessons in shaping their future lives.

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**.

President
Dr. Ben Akpan
Executive Director of STAN, Nigeria
E-mail: ben.akpan@stanonline.org

Secretary
Dr. Beverley Cooper
E-mail: bcooper@waikato.ac.nz

Past President
Dr. Jack Holbrook
Professor, Centre for Science Education
University of Tartu, Estonia
E-mail: jack@ut.ee

Treasurer
Lindey Conner
E-mail: lindsey.conner@canterbury.ac.nz

President Elect
Dr. Teresa J. Kennedy
Professor, University of Texas at Tyler
E-mail: tkennedy@uttyler.edu

Regional Representatives

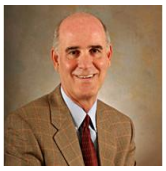
Regional Representative for Africa
Mamman Wasugu
E-mail: mammanwasagu@yahoo.ca

Regional Representative for Europe
Dr Declan Kennedy
E-mail: d.kennedy@ucc.ie

Regional Representative for Asia
Azian Abdullah
E-mail: azian@recsam.edu.my

Regional Representative for Latin America
Christiane Gioppo
E-mail: cgioppo@yahoo.com

Regional Representative for Australia/Pacific
Christine McDonald
E-mail: c.mcdonald@griffith.edu.au



Regional Representative for North America
Michael Padilla
E-mail: padilla@clemson.edu

ICASE Executive Committee 2011-2013

Chairs of Standing Committees

Safety in Science Education
James Kaufman
E-mail: jim@labsafetyinstitute.org

World Conferences & Environmental Education/Sustainable Development
Elaine Horne
E-mail grovesr@ozemail.com.au

Pre-secondary and Informal Science Education
Dr Steven Sexton
Otago University New Zealand
E-mail: steven.sexton@otago.ac.nz;

Publications & Website
Dr Bulent Cavas
E-mail: bulentcavas@gmail.com

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