Supporting and promoting science education internationally

The ICASE Newsletter February 2010

Newsletter of the International Council of Associations for Science Education.

Contents of this issue (to go to any item, select, then click left mouse button)

1. ICASE News

ICASE journal online

See www.icaseonline.net/sei Contributions are now welcome from all science educators. Although there is no deadline and accepted articles will be up loaded when appropriate, the next issue is scheduled for June 2010. Subject to funding being available, this issue (specifically for participants at the 3rd ICASE World Conference in Tartu, Estonia - see below) will be made available in a print as well as an online version.

World Conference 2010, June 28-July 2, 2010

Conference registration is now open. The earlybird fee (until 15 April, 2010) is 350 Euros (*with a reduction for persons from ICASE member organisations attending the General Assembly as official delegates - 320 Euros**). Details of hotel prices and booking is also available on the website (www.worldste2010.ut.ee) and participates are urged to make their selection. You will note that prices are very favourable by European standards. The main conference hotels are London, Antonius and Dorpat. Limited dormitory accommodation is also available for those wanting even cheaper accommodation. Please note – all listed hotels are within walking distance of the University (the main conference venue).

Special note to the Chairman/President of Science Teacher Associations. Is your organisation planning to be represented at the World Conference ? If so, may I specifically invite your association to run a 2 hour symposium within the conference, based on presented papers by members of your association. This is a unique opportunity for you to promote the activities of your association as well as enabling ICASE to fulfil its given mandate of enhancing communication and the sharing of innovations and developments among Science Teacher Associations worldwide. For further information and queries please contact the ICASE President on jack@ut.ee

** This reduced fee is also applicable for each member of groups (minimum 5) registering at the same time (but registration may be affected individually) and notifying the conference secretariat by e-mail of the group leader (group contact person).*
** the reduced fee is also offered to delegates from ICASE member organisations in less developed countries (as defined by UNESCO) whether coming as a group, or individually.*

ICASE General Assembly, June 28 2010 (Tartu, Estonia)
ICASE is pleased to announce to all current and future member organisations that its General Assembly will be held immediately prior to the World Conference. All science teacher associations worldwide are urged to participate. The ICASE Executive Committee also announces that all member organisations are eligible to raise matters of interest for the General Assembly Please contact the ICASE President on matter you would like to raise – jack@ut.ee

The General Assembly is where the ICASE Executive Committee report to its Governing Body (the member organisations) on its activities since the last General Assembly (2007) and seeks approval from the governing body for future directions. The General Assembly is crucial for the operation of ICASE, and hence the link between ICASE (as the international coordinating body) and its member organisations. It is thus of great importance that all member organisations identify **their representative** to the ICASE General Assembly, if ICASE is to continue meaningfully in line with the wishes and expectations of the Governing Body.

ICASE is all too aware that many member organisations, especially those in developing countries, have little financial support and are unable to support the travel of its representative to the General Assembly. ICASE will do its best to ensure minimal accommodation costs for such delegates, as well as try to facilitate their involvement in the World conference and to provide a meaningful experience. Alas, ICASE does not have a funding source, other than member subscriptions, and is extremely poorly placed to subsidise airfares. Also ICASE finds it almost impossible to secure sponsorship, as it has no recourse to international financial sources (and national sources are, of course, important for the financial well being of ICASE member organisations). Hence sponsorship for delegates to the ICASE General Assembly really needs to come via the member organisations, seeking help from national sources that become available.

If as a last resort, member organisations are not able to support their delegate to the ICASE General Assembly, ICASE permits written submissions on issues of concerns (which if submitted at least 1 month before the 28 June will feature in the General Assembly) and also ICASE permits proxy votes on all voting matters raised by the ICASE Executive Committee or by member organisations. For more details on making submissions and ensuring proxy voting, please contact the ICASE President, Jack Holbrook, on jack@ut.ee.

The main publicity and information source regarding the conference is the website and this will be updated regularly. The website is www.worldste2010.ut.ee However this newsletter will continue to inform and I am pleased to add new e-mail contacts on request (contact jack@ut.ee).

This Newsletter
Are you aware of others who do not receive this newsletter? This monthly newsletter is international and is available to all science educators who would like to receive it. I especially appeal to readers in North America as the current circulation in the USA/Canada is much lower than in other regions of the world.

Science, Technology, and Innovation for Socio-Economic Development: Success Stories from Africa

A new book, prepared and published by ICSU Regional Office for Africa (contents outline attached herewith), will be available by 15 February 2010.

Limited number of copies of the book will be distributed free of charge throughout Africa, particularly to national and institutional libraries on the continent. Personal or additional copies may be purchased from the Regional Office.

The special price for this book is US$ 40,- or ZAR 300,- Direct all enquires concerning the purchase/postage of the book to:

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Contents

2. Science Activities

These following activities are from a collection built up by ICASE through its former primary science newsletter (STEP) and other sources. They are put forward to bring attention to small activities which can be carried out in the science classroom with minimal equipment.

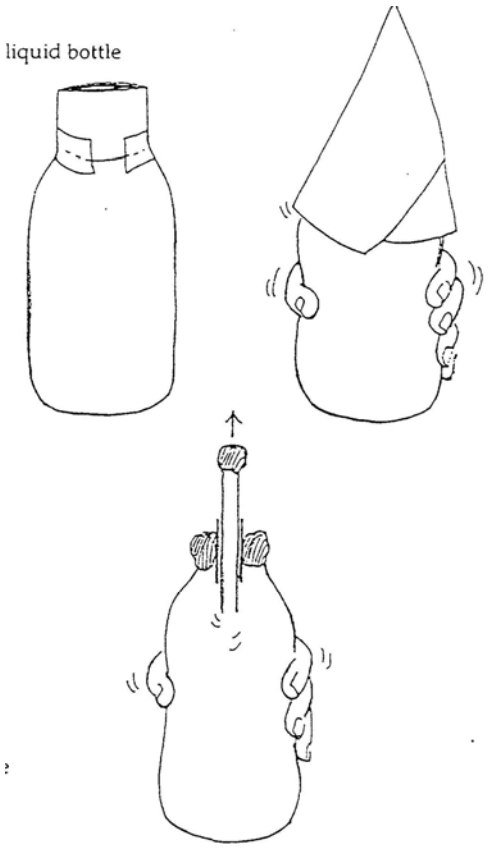
A) STEP ACTIVITY

Pneumatic rockets

Challenge: How far can you launch an air propelled rocket?

What you need

- plastic PET, or dishwashing liquid bottle
- plasticine
- wide plastic straw
- paper
- scissors
- cardboard toilet roll
- sticky tape
- thin plastic straw



What to do

Method 1: Remove the bottle cap. Tape the toilet roll tube over the neck of the bottle as shown. Make a paer cone as shown and place it on the toilet roll tube. With a quick movement, squeeze the bottle – use two hands if *you wish*. What happens to the paper cone rocket?

Method 2: Remove the bottle cap. Wrap a sausage of plasticine around a short length of the wide straw. Use this to plug the neck of the bottle as shown. Stick some plasticine to one end of the thin straw. Slide the thin straw down inside the wide straw as shown. Now you are ready to launch the straw rocket. Quickly squee bottle - use two hands if you wish. What happens to the straw rocket?

More to do

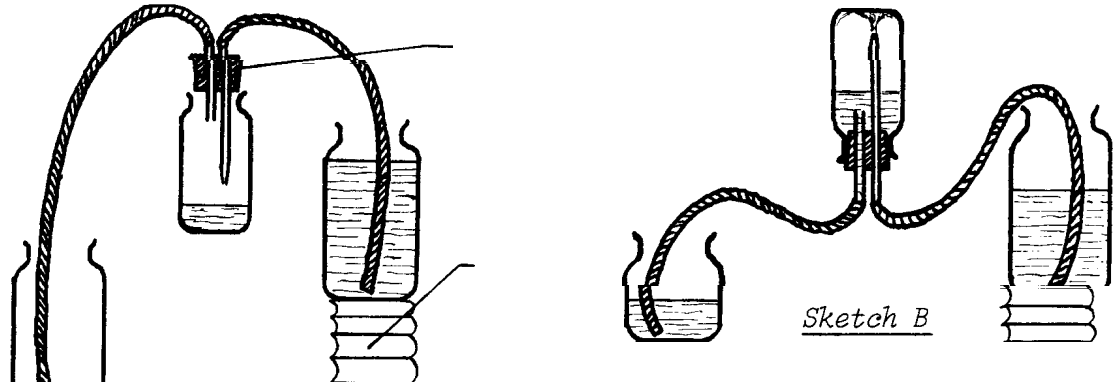
- How can *you* make the paper cone rocket or the straw rocket go higher?
  Try cones of different shapes and sizes. Try straws of different lengths and with different amounts of plasticine. Try adding fins. Design other ways to launch your rockets.
- Design the paper cone so that it descends like a parachute, Design the straw rocket with a parachute so that it falls slowly back to the ground.
- How could you measure the height of each rocket launch ?

B) ADDITIONAL SCIENCE ACTIVITY

AIR EXERTING PRESSURE

THE PERPETUAL FOUNTAIN?

Materials:
1. One medium sized jar and two large bottles.
2. A 2-hole stopper fitting the jar, 2 glass tubes (the longer one drawn to a point at one end).
3. Two lengths of rubber tubing (about 30 cm)



Procedure
1. Push the two pieces of glass tubing through the 2-hole stopper such that the one with the point extends farther than the other (see Sketch)
2. Connect the two lengths of rubber tubing to the glass tubes.
3. Fill one of the two large bottles full with cold water and set up the flask and the two bottles as shown in Sketch A (Hold the jar).
4. Pour about 100 ml of water in the jar and insert the stopper tightly.
5. Invert this jar, making sure that the two rubber tubes stay in the two bottles (the end of the tube in the bottle with water should stay under water at all times).

Questions:
1. What was the first thing that happened after inverting the jar?
2. What happened to the volume of the air pocket above the water in the jar as the water poured in the empty bottle?
3. Why was the water drawn up into the jar?
4. Why does the water-filled bottle have to stand higher than the other?
5. How can we make the fountain flow more strongly or slower?

Explanation:

The water in the jar was needed to 'prime' the siphoning action. Immediately after inverting the jar, the water ran down and out into the empty bottle. This caused an increase in volume of the air pocket above the water in the jar, thus decreasing the pressure. This lower pressure caused the sucking up of the water from the water-filled bottle. In other words, the atmospheric air pressure is pushing the water up into the jar. The larger the difference in height of the water levels in the two bottles the stronger the flow of water. As soon as the water levels are the same height in both bottles, the water flow will stop. This is the same principle of the siphon.

C) USING EXPERIMENTAL IDEAS IN SCIENCE TEACHING

This newsletter contains two experimental ideas. It is hoped that these are of interest.
But how to use these experiments in teaching ? Teachers need to be free to include experimentation as they feel best, but given below is ICASE thinking in putting forward the experiments in this newsletter. Teachers and science educators are welcome to comment.

1. Who does the experiment ?

Clearly these experiments can be undertaken as a teacher demonstration. However, the intention is that the students are involved, either working individually, or more likely, in small groups. The apparatus is kept as simple as possible and can often be brought from home, or made by the students themselves.

Why is student involvement preferred ? We note the old Confucius saying – I hear and I forget; I see and I remember; I do and I understand. The belief is that the more students are engaged, the more they learn. Teacher demonstrations, or large group experiments, limit student involvement and are thus not preferred.

2. Should instructions be given to students ?

The sections *'What to do'* and/or *'Procedure'* clearly spell out how to undertake the experiment. But it is not intended that the experiment must be used in this way. By following instructions, a *'cookbook,'* or *'follow a recipe'* situation is created. This highlights the **doing,** but **probably not** the understanding. Where instructions are provided, the student learning can be expected to be the explanation that follows. And the teacher is then focusing on students' explanatory skills. The questions have been added to the first experiment to encourage moves away from a 'cookbook' or 'do-and-forget' approach and towards a more exploratory approach. In the second experiment the questions seek understanding which can lead to modifications of the experiments for more novel effects. It will a pity if the teacher is the person who answers these questions. In fact it would be interesting to learn of situations where the students, themselves, are both asking and then answering the questions.

3. Inquiry learning

Can the experiments be used in an inquiry approach, whereby the students ***raise questions*** and **suggest the *purpose* and *procedure themselves* ?** This is very much an ICASE recommended approach. It means students put forward the investigatory question, plus the procedure to follow. It promotes science as the seeking of explanations to questions put forward rather than to a 'wondering why' approach, although perhaps this is appropriate for the younger students.

So what would be the investigatory questions for these experiments ?

This is a challenge left for you to consider.

3. Further Ideas for Greater Relevance of Science Teaching for the Enhancement of Scientific Literacy

Jack Holbrook, ICASE President

In the previous newsletter the questions posed were -
What alternatives are there to using a textbook ?
What are competencies and how do these relate to learning outcomes ?

A problem with textbooks is that they adopt a style, or a structure unaware of the teaching that will take place. This is not necessarily a problem for teachers who see themselves as the guiders of students with the textbook merely the support to be used as and when appropriate.

It is a big problem, however, if the textbook is driving the teaching and the teachers follow the style and pace indicated by the textbook layout. Unfortunately, for many teachers, the substance of textbooks has been viewed as the intended learning rather than a reference on which teachers and students can draw. While questions to stimulate thinking, or exercises to reinforce the learning are accepted as strong reasons for a textbook, there is the danger associated with an over-reliance on the textbook that the textbook really is consider to be the curriculum, even though this was probably not its intended purpose.

The curriculum provides the indication of the students' intended learning. In terms of subject matter and perhaps in terms of the depth of treatment of subject matter intended, the textbook may be able to provide a good picture and be a powerful aid to teaching and learning. But as the learning by students is related to the goals of education as a whole, textbooks are limited to that which can be expressed in a written/diagrammatical print. They clearly lack indicators of the length of time required for teaching of more generic aspects, reinforcement time needed by the teacher and the extent to which it is appropriate to follow the thinking, discussing or debating by students on issues and aspect the students consider of importance. The teaching being undertaken by the teacher is in fact better referred to as the implemented curriculum and interrelates to both the intended curriculum and the perceived needs of the students being taught? Clearly the textbook is unaware of the teaching geared to student needs and is thus limited in its applicability for teachers using a social constructivist teaching approach, or for wider educational learning.

Alternatives to the textbook can be (a) materials developed by the teacher themselves (these relate to the implemented teaching and are thus aware of the time allocations, baseline needs and the wider educational learning intended by the teacher) and (b) materials/modules meeting the teacher approach and favoured by the teacher. These modules are able to move away from a textbook approach especially if they are geared to the needs of the teacher rather than the student. The teacher decides whether the modules are of value, aspects to be introduced and also whether the modules are to be used as a whole, or in part. These modules can approximate, more strongly than the textbook, the structure of lessons and hence can draw attention to generic educational objectives. More is said on modules and generic objectives in later articles.

Teaching modules can be based on competencies which can focus on the educational capabilities (knowledge, skills, values, etc) to be developed. As accessible sources of knowledge continue to increase, the need for the teacher (or textbook) to provide such knowledge and for students to memorise such knowledge, understandably decreases. Instead, emphasis can be placed on learning to select, process and apply knowledge to new situations. This ability of transference of

knowledge to new situations is increasingly being seen in education as a major area of focus and can be described as the development of competencies. Unfortunately in English there are two words somewhat similar to each other – competency and competence and distinguishing between them is no simple task (if there is actually a meaningful difference at all!).

For some, the building of a competence means enabling a person to effectively apply transferred knowledge and skills to complex, diverse and unpredictable situations. Contrast this with competency as the ability to perform, based on specific knowledge, skills, attitudes and values. Is there a difference? If there is a difference it is likely to be seen in that competence is more general and not necessarily solely related to behaviour (competence has been equated in some cases as a virtue). Competencies can be linked to a competence as abilities to perform specific attributes leading to a competence, but it is not suggested that summing the competencies necessarily equals the competence. In this way of thinking, competencies are the capabilities to be developed, but need to be carefully considered lest they are taken as outcomes based attributes, excluding the process by which they are attained. Competencies thus differ from learning outcomes in that they take on board the process and values as well as the attribute developed.

In a previous column it was suggested that competencies might include the ability to gain knowledge and skills as well as the ability to transfer knowledge and skills to new situations. If this is the case, a competency can be obtained by memorisation which rather defeats the view to move education away from the memorisation of knowledge and into more meaningful selecting and processing of knowledge. It is thus suggested that competencies are best regarded as transference abilities involving higher order, analytical, modeling or evaluative skills, above and beyond the ability to state, name or even simply explain.

In school, the development of competencies can be seen as putting in place abilities which eventually lead to the development of competence in a given field, perhaps very appropriate for a career. It can be described therefore as developing capabilities towards the attainment of life skills. As such, emphasis moves away from subject-based knowledge learning and into basic or key competencies - competencies necessary for leading purposeful, responsible and successful lives.

Basic and key competencies are suggested as those which meet the following:

- potentially beneficial to all members of society;
- relevant to all, irrespective of gender, race, culture, family background or mother tongue;
- comply with the accepted ethical, economic and cultural values and conventions;
- geared to the most common and likely situations citizens will encounter during their lives.

Does this suggest that basic and key science competencies do not exist, or if they do that they are not a permanent feature but change with changes in society?

Many prominent competencies are generic in nature e.g. communication, problem-solving, reasoning, leadership, creativity, motivation, team-work, meta-cognitive ability, capacity to control one's thinking and learning processes. They may be sub-divided e.g. competencies such as the capability to show curiosity, creativity, scepticism, honesty, enthusiasm, self-esteem, reliability, responsibility, initiative, perseverance and self-esteem can be classified as personal.
Are prominent competencies also basic or key competences and capabilities to be developed in all subject domains, including science?

This leads to further questions:
Do subject competencies exits and if so what importance do we need to attach to these ?
What is the advantage of promoting capabilities over learning outcomes?

4. SAFE SCI Be Protected

Article provided by Dr. Ken Roy – Director of Environmental Health & Safety, Glastonbury (CT), an authorized OSHA instructor and science safety consultant. Email: Royk@glastonburyus.org

LAB SAFETY ISSUES: THE DIRTY DOZEN!

I. The Winds of Change

The need for more scientifically/technologically literate citizens, changing student enrolments, economic shortfalls, emphasis on hands-on laboratory science, acceleration of master teachers retiring and neophyte teachers entering service, and aging buildings/lab facilities, continue to be major factors, amongst others, that are affecting science in our schools today. Government and professional education leaders are at the helm trying to help navigate the ship of science education in the best direction, given the rough waters we are witnessing. In some instances just trying to keep the ship afloat is the big challenge. Still, of utmost importance to doing science in all planning and policy making relative to facilities, curriculum, students and personnel, is safety.

School leaders need to be aware of areas for potential safety concerns in school science laboratories, especially in this state of economic anemia. This knowledge will help them make sound fiscal, curricular, personnel and safety policy decisions. Remember – the one place you can not cut back on is safety!

The purpose of this article is to simply update those safety problems called the "dirty dozen!" This information will help science teachers to educate and work with their supervisors. Supervisors can then be advocates for change, leading to improvements in the science laboratory.

II. What Are the Dirty Dozen?

1. Air quality – including ventilation, fume/exhaust hoods, bio-aerosols, radon gas, etc. This is applicable at all levels where hazardous chemicals are being used – primary and secondary levels.

2. Water quality – including radon gas, lead, copper, nitrates, methane gas, eyewash/ shower drains, etc.

3. Electricity – including ground fault interrupters (GFI), EMF's, etc. In laboratories or classrooms where water and electricity are being used in close proximity, there is danger of shock or electrocution. Circuit breakers only protect the building – not its occupants. There is a need for GFIs in order to protect employees and students! EMF's continue to be an issue – especially in Europe, Australia and other countries. Some schools under public and employee pressure have stopped installing Wi-Fi networks systems until additional research is provided on the long term effects of EMF's!

4. Heavy Metals - including mercury thermometers, florescent Bulbs, barometers, manometers, sphygmomanometers, elemental mercury, etc. Mercury needs to be removed and environmentally disposed of.

5. Asbestos – including floor/ceiling tiles, burners, laboratory table tops, walls, etc. Friable asbestos is dangerous and still found in many schools. Asbestos needs to be either encapsulated or abated.

6. Chemical Management – including improper storage, use, and disposal. Many schools have hazardous chemicals which are unlabelled, not dated, improperly stored and incorrectly disposed.

7. Personal Protective Equipment (PPE) – Schools need to adopt regulatory standards and best professional practices for use of eye protection, hand and body protection as required. If the appropriate PPE is not available, the activity should not be done!

8. Engineering Controls - Appropriate engineering controls such as fire suppression equipment, master energy controls, fume hoods, ventilation systems, and more are the safe guards for employees and students. Laboratories using hazardous chemicals should not be operated without appropriate engineering controls.

9. Radiation – including ionizing (radioactive materials) and non-ionizing (UV, lasers) radiation - Safe guards including appropriate levels, signage, use policies need to be addressed.

10. Biohazards – including microbes, mold spores, bloodborne pathogens, etc. – MRSA, AIDS, H1N1 and other microbes are more of an issue than ever before. Schools need to adopt policies and practices to reduce exposure; e.g. no human blood typing, no fresh cheek cell labs, etc.

11. External Factors – including roofing materials, oil base paints, custodial chemical technology revolution, custodial mechanical technology revolution, etc.

12. Personnel – including unsafe practices, unskilled, insufficient knowledge, etc. – Annual safety training is absolutely critical for faculty teaching science at any level!

13. Standard Operating Procedures (SOP's)– Some schools lack SOP's based on administrative procedures. Procedures should be written and the basis of annual safety training programs.

III. Insuring A Safe Working Environment

Once science educators are aware of the "dirty dozen," they can take steps to insure a safe working environment for employees and students. Using the process "AAA" –Awareness, Assessment and Action, each of the dirty dozen can be addressed in earnest.

"Live Long and Prosper, Using Safety!"

5. National Association for Science Education in China - Recently Established

DING Bangping, Capital Normal University, Beijing, P. R. China
LUO Xingkai, Guangxi Normal University, Guilin P. R. China

On November 9th to 11th, 2009, the National Association for Science Education (NASE), which is one of the many branches of the Chinese Society of Education, was formally established in Nanjing, China, during the founding conference.

There were 370 participants present in the Nanjing founding conference. Professor Wei Yu, a member of the very high prestige Chinese Academy of Engineering (CAE) and the vice Chairperson of the China Association for Science and Technology (CAST), was elected as the founding president of NASE, and Ms. Zhirong Wei, vice Editor-in-general of the People's Education Press; Professor Xingkai Luo of Guangxi Normal University in Guilin, Guangxi province; and Professor Shujin Peng of Sichuan Normal University in Chengdu, Sichuan province; were elected as standing vice presidents, with 8 others elected as vice presidents. Ms. Mao Cai, an editor with the People's Education Press was elected as the secretary-general.

The National Association for Science Education (NASE) in China consists of three working committees, each representing primary school science education, secondary school science education, and science teacher education in institutions of higher learning respectively. There have been elected 43 standing members and 133 members for the three committees, representing primary and secondary science teachers and facilitators, science educators and researchers in colleges and universities and/or other research units involved in science education.

The official website of the new association is *www. nase.org.cn* and will be soon opened.

The establishment of the National Association for Science Education is aimed to promote and advance science education reforms and science education research in mainland China.

6. Calendar of Events

National Science Teachers Association (NSTA), Philadelphia, USA
The next NSTA **National Conference will be held in** Philadelphia, PA from March 19-21, 2010. Please consult the NSTA website for more details – www.NSTA.org
An international day will be held on the 18th March on Global Conversations in Science Education Conference Philadelphia, Pennsylvania THEME: "Assessing Student Understanding of Science: Perspectives and Solutions" This special day is dedicated to science education from an international perspective. **It will be a ticketed event (M-2), open to all registered attendees of the NSTA National Conference on Science Education (at no additional cost).** Tickets were made available from last November. Conference registration and hotel information is now available on the NSTA website at http://www.nsta.org/conferences/2010phi/

Activities begin on Wednesday, March 17, with a President's International Reception for all international visitors and invited guests. On Thursday, the day commences with a welcome ceremony, including a NSTA conference orientation, followed by a plenary talk by Dr. Rodger W. Bybee, Chair of the PISA 2006 Science Expert Group. Dr. Bybee will speak about global assessments and comparisons. There will also be concurrent sessions related to the theme focusing on formative, summative, and global assessments. A full complement of papers will also be presented in a poster session, along with a luncheon plenary speaker, Dr. Robin Millar, Chair of the Departmental Research Committee at the University of York, UK. Dr. Millar will speak about problems related to assessing what students really know. The day will conclude with a panel discussion with Dr. Bybee and Dr. Millar. For more information, please visit the website at http://www.nsta.org/portals/international/intlsciedday.aspx.

20th International Symposium on Chemistry and Science Education "Contemporary Science Education – Implications from Science Education Research about Orientations, Strategies and Assessment" will be held May 27-29, 2010 at the University of Bremen
(Building of the Department of Chemistry and Biology, Leobener Str. NW2, 28359 Bremen, Germany).
This Symposium continues a long tradition stretching back to 1981. In the past, symposia repeatedly raised the question of how science education research can help to improve chemistry and science teaching and learning. But the question of how to promote successful science learning automatically implies a further question: Which are the objectives to be reached? Is science teaching primarily aimed at learning the content and theories of science? The 2010 symposium simultaneously maintains and further develops the topics of the past symposia from 2002-2008, in which we discussed the orientations and methodology of science education research, questions of teacher education and successful science learning. In one way or another, all symposia touched upon the question of valuable orientations in chemistry and science education.
Main questions will include:
- How and where do we see the balance between the learning of science facts and theories vs. more general education objectives derived from educational theory?
- What conclusions must we draw when more deeply reconsidering the essential elements of the scientific literacy debate, activity theory and the German concept of "*Allgemeinbildung"?*
- Which answers can be obtained from general and science education research when considering different approaches towards science teaching?
- Which issues and strategies obtained from science education research can be seen as valuable tools to apply to chemistry and science teaching?

- What is state-of-the-art in context-based and/or STS-oriented science curriculum development and what do we know about the effects of these respective approaches?
- What do we know from research about attitudes, motivation and PCK of practicing teachers concerning different approaches towards chemistry and science teaching?
- Which research-based strategies do we have for implementing changes and for teacher education towards modern approaches to chemistry and science teaching?

The conference language will be English and the conference will be chaired by
Prof. Dr. Ingo Eilks, Institute for Science Education (IDN), Didactics of Chemistry, University of Bremen *ingo.eilks@uni-dortmund.de*
Prof. Dr. Bernd Ralle, Department of Chemistry, Didactics of Chemistry I, Dortmund University of Technology, *bernd.ralle@uni-dortmund.de*

Further information

The final program with abstracts, information on travelling and accommodation will be published on the web at *http://www.chemie.uni-bremen.de/eilks/symp2010/index.html* by January 2010.

Conference fees and registration

There is no conference fee. Costs for travelling, accommodation and social events are covered by the participants. All information and the registration form will be published on the web accompanying the final program in January 2010.

The XIV IOSTE International Symposium on Socio-cultural and human values in science and technology education will be held June, 13th to 18th, 2010 in Bled, Slovenia and hosted by the University of Ljubljana, Slovenia. Details on submitting papers and other information please see the conference website - http://www.ioste14.org. For additional information, contact Dr. Slavko Dolinšek, Director of the Institute for Innovation and Development, University of Ljubljana, Slovenia E-mail: dolinsek.slavko@fs.uni-lj.si

ICASE World Conference, 28th June – 2nd July, 2010, Tartu, Estonia

The 3rd ICASE World Science and Technology Education Conference will be held at the University of Tartu. All science educators, including science teachers, are cordially invited to participate. Conference theme - **Innovation in science and technology education: research, policy, practice.** *[See website for more details on programme, registration and accommodation - www.WorldSTE2010.ut.ee]* Following the conference, tours are being arranged to St.Petersburg, Russia; Riga, Latvia, and Vilnius, Lithuania.

Associated with this conference will be the ICASE General Assembly to which all ICASE member organisations are kindly asked to send a representative. The ICASE General Assembly will be held on the 28th June and this important meeting will plan the work and direction for ICASE over the coming 3 years. For further details on the General Assembly please contact the ICASE President - jack @ut.ee

10th ECRICE and 4th DidSci conference, Krakow, Poland July 4 – 9, 2010

The organizing committee cordially invites you to attend and participate in the 10th European Conference on Research in Chemistry Education (ECRICE) and 4th International Conference Research in Didactics of the Sciences (DidSci). Based on a long tradition, ECRICE is organized under the auspices of EuCheMS (formerly FECS), in relation to the activity of the Division of Chemical Education. This meeting follows successful conferences held in Istanbul (2008), Budapest (2006), Ljubljana (2004), Aveiro (2001) etc. This Conference is an opportunity to

exchange experiences on research in chemical education (ECRICE) and research & practice in natural science education (DisSci) carried out at every education level from primary school to graduate studies. The aim of the conference is to familiarize participants with the most recent achievements in the various scientific centres. The programme will feature a wide variety of plenary, invited and contributed lectures, as well as poster sessions. For more details please see the website - http://ecrice2010.ap.krakow.pl/

Abstracts of oral contributions and posters will be peer reviewed. The language of ECRICE will be English, whereas the language of the DidSci component of the conference will be English, Polish, Czech, and Slovak. For more information contact: Iwona Maciejowska ECRICE 2010 secretary at e-mail address: ecrice2010@ap.krakow.pl or Małgorzata Nodzynska DIDSCI 2010 secretary at e-mail address: didsci2010@ap.krakow.pl

21st International Conference on Chemical Education (ICCE), Taiwan, August 8-13 2010.
The theme of the 21st ICCE is Chemistry Education and Sustainability in the Global Age. The deadline for proposals is March 31, 2010. For further details contact :
http://icce2010.gise.ntnu.edu.tw

The 23rd Asian Association for Biology Education will be held in Singapore, from 18-20 Oct, 2010, at the National Institute of Education, Singapore. The theme of the conference is: **Biology Education for Social and Sustainable Development**. The 3-day conference will have 6 plenary speakers, oral and poster presentations, country reports, a workshop on Problem Based Learning in Biology, and mid-and post-conference tours.

The conference is jointly organized by, the National Institute of Education, the Asian Association for Biology Education, Singapore Institute of Biology, and Science Teachers Association for Singapore.

The website for the conference is http://www.nsse.nie.edu.sg/aabe2010/

7. ICASE Executive Committee 2008-2011

Based on the ICASE constitution, the ICASE Management committee as well as Regional Representatives are elected by member organisations. These elected members, in turn, nominate chairs of relevant standing committees. Together these persons form the ICASE Executive Committee and are the persons who make decisions on behalf of the ICASE Governing Body. The ICASE Governing Body is the **ICASE member organisations**.

The Executive Committee **(the decision making body working under the Governing Body)**

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