*Supporting and promoting science education internationally*

# The ICASE Newsletter January 2010

Newsletter of the International Council of Associations for Science Education.

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## 1. ICASE News

**On behalf of the ICASE Executive Committee, and the ICASE member organisations (the ICASE Governing Body), may I wish all readers a Happy and Prosperous New Year.**

**ICASE journal online**

At long last this journal is now online. See www.icaseonline.net/sei Contributions are now welcome from all science educators. There is no deadline and accepted articles will be up loaded when appropriate.

**ICASE General Assembly, June 28 2010 (Tartu, Estonia)**

ICASE is pleased to announce to all current and future member organisations its General Assembly, to be held immediately prior to the World Conference. The ICASE Executive Committee also announces that all member organisations are eligible to raise matters for the General Assembly (including presentations and demands for voting on issues of interest such as changes in the ICASE constitution). Please contact the ICASE President – 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.

And as a final reminder, please note that the ICASE General Assembly can only be held if 50% of full members participate, either through their officially appointed delegate being present in person, or by means of a proxy nomination (this stipulation is an ICASE constitution requirement). If no General Assembly is possible on the 28 June 2010, a second General Assembly will need to be organised before end of 2010 (when the term of the current Executive Committee expires) and if this fails to attract a quorum, ICASE will then cease to exist.

**World Conference 2010, June 28-July 2, 2010**
Submissions are welcome from science educators and especially from teachers of science subjects. The deadline for abstract of papers and a 3 page synopsis has been *further extended* until the15th January 2010 (see www.worldSTE2010.ut.ee or www.icaseonline.net). This will, however, need to be the last extension as all synopses will be reviewed and guidance given by reviewers, where appropriate, for revising and re-submitting their presentation, poster or workshop. There will be no need for the full paper (full papers will be solicited after the conference for a conference book and for articles in the ICASE online journal).

**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**). The non-earlybird rate for all will be 400 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).

** This reduced fee is also applicable to 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.*

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)

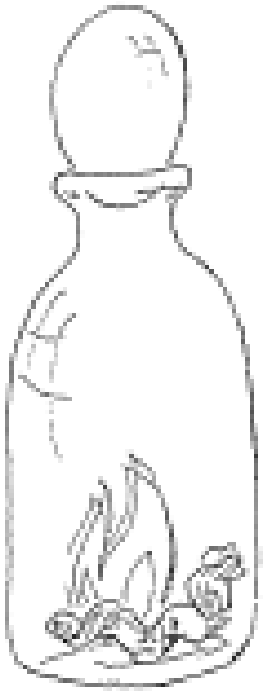
# 2. Science Activities

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

**Egg in a bottle**

**Challenge can you put an egg into a bottle ?**



**You need**
Eggs
Bottle
Matches
Paper
Tray to stand bottle on

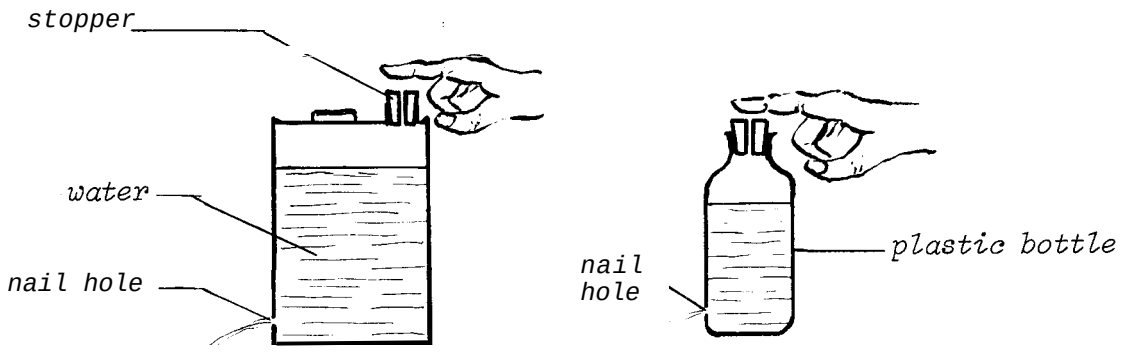
**What to do**
Remove the shell from a hard boiled egg
Light a small coil of paper and drop it into the bottle. Immediately place the egg over the mouth of the bottle. What do you see happening?

**More to do**

What happens if you put more and more burning paper into the bottle?
Does the size of the mouth of the bottle make a difference?
Try another way to get the egg in to the bottle. Heat the bottle inside and out. Pour water out and place the egg over the mouth of the bottle as the bottle cools. What happens ?
Are there other ways to get the egg into the bottle?
How could you get the egg out of the bottle?

## B) ADDITIONAL SCIENCE ACTIVITY

**EXERTING PRESSURE STOP THE LEAK**




**Materials:** 1. An empty can or plastic bottle.
2. A one-hole stopper fitting the neck of the can or bottle.

**Procedure**

1. Punch a hole in the side near the bottom of the can or bottle with a small nail
2 Fill the can or bottle with water and show the leaking container.
3 Ask "How can I stop the leak without wetting my finger?"
4. Put the one hope stopper in the can or bottle and cover the hole with your finger: the leak is stopped!
5. Release your finger from the stopper: the leak will start again.

**Questions**

1. Why did the water stop flowing out of the can?
2. How could we stop the leak without the one hole stopper?
3. Does the water stop flowing immediately after the hole is covered?
4. How does the air pressure inside the can compare with the atmospheric air pressure after the water stops flowing?
5. What is it that we prevent from entering the can by covering the hole?

**Explanation**

The water does not stop flowing immediately after covering the stopper, but it still keeps dripping out of the can for a while. This increases the volume of the air pocket above the water. The amount of air stays the same because air is prevented from coming into the hole in the stopper. The increase in volume causes a decrease in pressure (Boyle's Law). The outside atmospheric air pressure pushes against the water and prevents it from flowing out.

This is why we always punch two holes in a can of evaporated milk in order to pour the milk out. Also on a gallon frying-oil can, it usually is recommended to punch a hole in a corner opposite the pouring spout. This hole will allow air to enter the can while oil pours out. It will promote a smooth flowing of oil out of the can.

## 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 - *How are teaching contexts identified ? And if an 'acquire knowledge first, utilise the knowledge second' approach is not appropriate, what approach should be considered ?*

Enough has already been said in previous articles to suggest that following a typical science textbook is not likely to be an exciting learning approach for students. Rather it has been suggested that a context to which students can positively identify is to be preferred. This context is most likely to be the society, or happenings within the society in which the student lives. But by involving such a social context, it does not mean that the teaching of science becomes non-conceptual and simply takes on the appearance of a social science discussion. This is not being suggested, not by any means. The goal of science teaching is still considered to be the gaining of scientific knowledge, skills and values, plus importantly, the ability of students to transfer their learning to new situations. The latter is very much in line with the enhancing of scientific literacy. The suggestion being put forward is that by involving a social context the science learning is given a more meaningful rationale, even if the time spent guiding students to acquire scientific concepts far outweighs the introduction provides by such a meaningful, or relevant context.

Specifying the rationale for any learning procedure being put before students is very desirable. However this is not standard procedure. In mathematics, differentiation or integration procedures can be carried out in the upper school, or trigonometry in basic school, as mechanical practices devoid of relevance and purpose. It makes the arriving at the correct solution simply procedural and out of any context. A similar situation can occur in science. Science conceptual acquisition can be promoted without any meaningful context and if accompanied by solving algorithms, it simply becomes a further focus on 'drill and practice.' This is not a desirable situation and it is not very exciting, as students testify. Yet it can be considered the typical textbook approach. More exciting, surely, is to provide a relevance rationale for the learning and then undertake the science conceptual learning by building on this starting point. An example of an approach to the conceptual learning, currently strongly promoted in science education, is through the use of guided inquiry, whereby the teacher guides the students to find answers to questions and (as much as possible) the students answering questions which they, themselves, have previously put forward.

**NOTE** – the term 'guided inquiry' has been used here. In this situation it is suggested that the teacher is likely to play a crucial role in supporting the students in their learning, not only in the gaining of process or procedural skills, but also in cognition. When the students are sufficiently advanced and are able to put forward the initial inquiry question (the scientific question to be solved) and provide answers to operational questions, then the term 'open inquiry' is often used.

Open inquiry is considered a desirable teaching approach as this involves the transference of learning to new situations. The teacher role becomes more one of reinforcement, rather than leading student thinking. Furthermore, this role is likely to be attitudinal and encouraging rather than solely cognitive. But whether guided, or open inquiry, is the preferred teaching approach, it is important to appreciate that the teacher is endeavouring to build up the students' self efficacy. The students' 'learning to learn' is aided by the students' feeling of self ability. This, of course, is

very important for promoting the transference of ideas, procedures and values held by students to such new situations as dealing with socio-scientific issues in society. For example, in making socio-scientific choices, how do we promote the need to consider factors such as 'life cycle analysis' (considering costs, environmental factors, ethical issues and other conditions from the earliest stages of conception to the ultimate disposal issues of artefacts; the so-called 'cradle to the grave' factor), or risk assessment scenarios in making decisions (such as exposure to different forms of radiation – heat, nuclear, cosmic, or free radicals) ?

In putting emphasis on the transference of learning, it is clear that stopping at the memorisation of facts, or the routine operation of experimental procedures, should not be considered major goals for science education. And surely it is high time that internal and external examinations recognise this and stop acting as a constraint on the more important and meaningful learning in science education.

Furthermore, the typical textbook approach, which is to put information and conceptual learning first and to follow this up with applications of the ideas second, must be reconsidered. It is not in line with a relevant context first, acquisition of the science conceptual learning second and then the transference of the learning to new situations as a third key step. Even though the second step will dominate (it has to if conceptual learning is to be consolidated), it is important that this is not taken as the ultimate target, as the typical textbook would have us believe. It is necessary to go further into *step 3* and appreciate the application of the conceptual ideas to new situations where factors influencing the decision making can change. And with this, it is clearly suggested that a change of approach is needed, as is being illustrated by the more exciting context-related textbook offerings now on the market in more progressive countries. This leads to the question of considering textbook alternatives and the changing background required for science teachers.

If memorisation of knowledge and practicing skills are not the major focus of science education, what is the needed image of science being taught in school? This is a key question and a similar question could be asked for the education in schools in general and hence for the role of teaching in other subject areas. The European Union has come out strongly in favour of the need for citizens to acquire competences. Students need to gain a range of competencies so as to build up the needed competences for everyday life, for careers and for tackling issues facing society in a global environment which, for developed countries, can be considered as a post-industrial situation.

Unfortunately, it is not clear whether developing such competences relate solely to the transference of knowledge and skills to an application phase, or whether the gaining of the basic knowledge and skills deemed appropriate is also part of the competency acquisition. This is even more confusing when introducing terms such as 'basic' or 'key' competencies and especially so when applied to a 'subject competencies' (school subject) rather than to generic educational needs such as communication abilities, collaboration abilities or the ability to make reasoned decisions.

This leads to the following questions to be considered further in the next newsletter –

*What alternatives are there to using a textbook ?*
*What are competencies and how do these relate to learning outcomes ?*

# 4. SAFE SCI Be Protected

*Article provided by Dr. Ken Roy – Chairman of the ICASE Standing Committee on Safety in Science Education. He is also Director of Environmental Health & Safety, Glastonbury (CT), an authorized OSHA instructor and science safety consultant. Email: Royk@glastonburyus.org*

***FIELDING SAFETY!***

## I. WHY UNDERTAKE FIELD EXPERIENCE?

Learning science is doing science! The best way to learn science is by doing hands-on, process and inquiry based learning activities. Working in the field as opposed to the formal academic classroom is a means to that end. Students should have as many field experiences as possible in concert with their classroom studies. The extent of field experiences depends on the age of students/grade level, school policies and available resources. That can range from working within the school grounds to taking hikes in a pasture, woodland or other types of more challenging terrain. However, no matter where the experience, a successful field experience needs to be a safe field experience. So what types of considerations should the teacher of science address to secure a safer learning experience in the field?

## II. SAFER SCIENCE IN THE FIELD!

The following items provide teachers of science an introduction to planning for a safer field experience. It is a point to begin and certainly should have additional considerations depending on the age of students and the location of the field experience, to mention a few.

LET THE LIST BEGIN!

- **Walk-The-Walk:** Always 'walk-the-walk' before taking a field trip with students. Know the terrain, hazards, etc. and be prepared for them. Hazards such as broken glass, trash, branches, insects (bees, mosquitoes, ticks), wild animals, crossing streams and rivers, poisonous plants (poison ivy), unlevel ground, etc. should be considered.

- **Permission Slips:** Make sure student permission slips or acknowledgement forms are provided for parents/guardians to sign, acknowledging the specifics of the trip and its academic purpose. Also note what is being done to make it a safer trip.

- **Safety Training:** Provide basic safety training for all participants BEFORE the field trip starts. Include such things as overview of the trip, what happens if a participant is lost, injured, other medical issues, avoiding unsafe terrain, communications, etc.

- **Appropriate clothing:** Appropriate clothing depends on trail conditions and the season. All participants should make sure their bodies are completely covered below their neck – long sleeve shirts, pants, close-toed shoes or boots, etc. – jackets and gloves if necessary.

- **Sun-Wise:** All participants should have on hats, sun glasses and sunscreen when in the field to prevent over-exposure to UV rays.

- **Weather-smart**: Make sure you have checked the weather forecast before moving into the field. Never take the trip in inclement weather – rain, snow, etc. Also be aware of the likelihood of unpredictable weather such as thunderstorms, wind storms, etc.

- **First-Aid:** Make sure someone is trained in first-aid procedures in case there is an incident requiring medical attention. Also have a list of medical needs for all participants, including necessary medications, etc.

- **Itinerary:** Make sure the school knows where you are going and when you plan on returning in case there are issues or problems.

- **Togetherness:** Always travel in a group or groups – never alone! Develop a formal buddy system for all participants.

- **Rest & Water:** Participants should have rest time when walking long distances. Also make sure water and snack food for energy is available.

- **Communications:** Whistles for each participant, cell phones or walkie-talkies for group leaders, etc. are helpful for communications, especially in emergencies.

- **Personal Hygiene:** Make sure appropriate toilet facilities are available on long hikes at appropriate intervals. Also, have either soap and water or antibacterial wipes available for use.

- **Storm Plan:** Have a plan in case an unexpected thunderstorm, windstorm, etc. should appear. Review basic behavioral procedures with all participants fostering best safety practices.

- **Trip Kit Items:** In addition to a general first-aid kit, consider bring a trip kit with the following items: extra clothing for warmth, compass, extra food, flashlight, insect repellent, map, pocket knife, pocket mirror, trash bags, water, extra whistles.

## III. IN THE END!

Remember – the field experience for student learning is priceless! So is the safety! It doesn't matter if the trip is for five minutes or five hours. Try not to have any surprises which you did not anticipate. Planning will not eliminate all possible surprises but certainly it will make it safer for all participants!

**LIVE LONG AND PROSPER SAFELY!**

## REFERENCES

**Health Canada**: http://www.hc-sc.gc.ca/hl-vs/securit/season-saison/summer-ete/outdoors-pleinair-eng.php

**USDS Forest Service**: http://www.fs.fed.us/recreation/safety/safety.shtml

## 5. Display of the Interactions of Six Domains for Teaching and Assessing Science Learning

*A short article, with modifications, submitted by Robert E. Yager, Professor of Science Education, University of Iowa, USA,*

Six "domains" have been proposed by Yager and McCormack (1989) for teachers and students related to school science programs. These "domains" are in fact exemplified in eight facets of science that framed the so-called content in the US National Science Education Standards (NSES). Yet, unfortunately, all eight facets and hence the six domains are rarely considered when teachers, schools, and state departments of education consider the science curriculum. It is a sad fact that so little has changed after the four years of hard work in preparing the NSES standards, the production of a comprehensive, 262 page document, and the identification of many features that could indicate the real changes needed to enact science education reforms.

The eight facets of science learning elaborated in the NSES include:
1) Acquiring unifying concepts and processes in science; 2) Recognising/experiencing science as a process of inquiry; 3) Acquiring Physical science ideas; 4) Acquiring Life science ideas; 5) Acquiring Earth/space science ideas; 6) Transference of science ideas to Science and Technology in society; 7) Science supporting personal and social development perspectives; and 8) Historical developments and the Nature of Science. But, how to consider these as the real science learning ?

The proposed Yager & McCormack's six domains provide an important platform in assuring all facets of science learning included in the NSES 'content' are incorporated in moving to the real reforms in terms of teaching, professional development, assessment, as well as content itself (noting content knowledge acquisition should be considered AFTER the others are embedded!).

Science concepts and process skills are place in the Center of the Figure (see figure 1). They represent the world where scientists work to find more complete and accurate constructs regarding the objects and events that are encountered in the natural world. The processes are the skills scientists use to form new and more creative constructs. It is the place where science occurs by only about 0.0004 % humans across the world, i.e., the work of practicing scientists, but which, when related to the development of society, affects us all.

To stimulate more interest and support for science in society and in school science, two additional, enabling domains are extremely important. These surround the science constructs and processes and focus on attitudes and creative abilities. In turn these domains indicate that questions are at the heart of practicing and appreciating science and that school science must be liked if students are really going to learn meaningfully. The attitude and creativity domains must be experienced and developed so as to provide the link between practicing scientists and school/university science found in K-16 educational situations. The work of teachers is thus expected to act as links between school science and life outside of schools and cannot stop after simply promoting the concepts and skills domains. These enabling domains are like a cell membrane – controlling what enters the field of science, what and the way science can be studied in school, and what unknowns and perceptions define the work of scientists. Actually the figure would, in reality, be more accurate if it showed particles entering and exiting from the center world of science.

The largest of the six domains is the application and connections domain – the place where more than 90% of all humans live and operate in their lives. Most science educators would urge that

'scientific literacy for all' is desired – and would argue that life would be enhanced if science were experienced and appreciated by all, especially understanding the limitations of science when dealing with making decisions related to issues and problems within the society.

The sixth domain is identified last. It represents aspects largely the province of social scientists who study the practices used by scientists and characterize the actions, progress, value and use made of science in today's technology. It also provides a view of the nature of science for teachers of science as they attempt to cover a set (8 facet) curriculum in schools while making their students more aware of how scientists view and understand the universe and the objects and events which comprise it. The Worldview domain purports to include understanding and appreciations not often considered of interest to practicing scientists. Philosophers of science study in their profession facets of the nature of science. Historians are involved in the human dimensions associated with how science has changed over time. Sociologists study human interactions and values held by societies. Other fields in the social sciences include economics, psychology, and political scientists which also comprise an even wider community of social scientists interested in ensuring socio-scientific decisions made by society are made in a meaningful manner.

Components of the eight facets of the so-called NSES content, as well as the six domains, were all too often ignored in the delivery of science programs for K-12 students. Teachers, teacher educators, schools, and state departments of education took little notice of the efforts of the NSES reformers to enact aspects of change as the 1996 document was completed. Primary interest was heavily focussed on the change in the specific content of science found in textbooks and state standards. This mainly related to the first two domains, ignoring the others. And hence none of the real reforms encased in the NSES 8 facets have influenced the science most students experience. Even worse, new attempts to up-date the NSES (they are now 13 years old!) have reverted to efforts and attempts to define once again the same old concepts and skills that typically were included in all curricula and used as a direct transmission model for teaching.

We need more who understand the intentions of the reforms of the last decade and more who can find new ways of gaining more success with reformation of what school science needs to be, how it can and should affect daily living within societies, and how it can encourage more to question such ways to solve and put forward reasons decisions related to the many socio-scientific problems that continue to perplex us!

**Reference:**

Yager, R. E. & McCormack, A. J. (1989). Assessing Teaching/Learning Successes in Multiple Domains of Science and Science Education. Science Education, 73(1), 45-48.

**Figure 1: Display of the Interactions of the Six Domains for Teaching and Assessing Science Learning**

| | |
|---|---|
| Concept Domain<br>Process Domain | The typical focus for traditional teaching (i.e. basic science concepts and skills) |
| Creativity Domain<br>Attitude Domain | The two enabling domains (i.e. questioning & personal /social engagement) |
| Application Domain | Using concepts and processes in new contexts (i.e., living in the whole world with use of science as defined by NSES) |
| Worldview Domain | Examining the philosophy, history, and sociology of the whole science enterprise (i.e., where most people live and operate when not engaged with science directly) |

# 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 costs).** 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

# 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 for the Governing Body)**

**President**
Prof Jack Holbrook
E-mail jack@ut.ee

**Past President**
Dr Janchai Yingprayoon
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**Secretary**
Prof Miia Rannikmae
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**Treasurer**
Peter Russo
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**Regional Representative for Africa**
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Executive Director of STAN, Nigeria
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**Regional Representative for Asia**
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**Regional Representative for Australia/Pacific**
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**Regional Representative for North America**
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***Chairs of Standing Committees***
**Safety in Science Education**
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**World Conferences**
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