International Council of Associations for Science Education

Supporting and promoting science education internationally
The ICASE Newsletter

October/November 2020

Welcome to the ICASE October/November 2020 Newsletter!

Welcome to the ICASE October/November 2020 Newsletter! The ICASE Newsletter is a publication containing current information about ICASE initiatives conducted by ICASE member organisations, and topics of interest in the field of science education. The table of contents for this issue is in the right-hand column. The International Council of Associations for Science Education (ICASE) was established in 1973 by leadership at the United Nations Educational, Scientific and Cultural Organization (UNESCO) to link national science teacher associations and to extend and improve science education for children and young people throughout the world. Today, ICASE is a network of science teacher education associations, institutions, foundations and companies, working together to promote science and technology education internationally. ICASE facilitates communication and cooperation at national, regional, and international levels. The ICASE Strategic Plan (2013-2023) calls for ICASE member organisations to adopt a position of Excellence and Leadership in Science Education.

International Council of Associations for Science Education

Over the past 40+ years, over 200 organizations have been members of ICASE. Currently, there are 32 organizations from 30 countries contributing to the financial administration of ICASE.
www.icaseonline.net/membership.htm

Contents of Newsletter

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ICASE Annual Membership Update

It's time to renew your organizational ICASE member fees!

We are updating our records, please complete the ICASE member information sheet found on our membership page: https://www.icaseonline.net/membership.html

Membership fees are due January 1st each year and three-year options are available at a reduced rate! Membership renewal is easy and can be done totally online on the ICASE Website at: http://www.icaseonline.net/membership.html and a receipt will be sent to you. If your organization needs to receive an invoice, please notify us to request an invoice.

ICASE provides opportunities for member organizations and their representatives to promote excellence and innovation in science teaching and learning for all through:

- connections to the members of other science organizations around the world;
- opportunities to serve in ICASE international leadership positions on standing committees and in international research initiatives;
- communication venues to disseminate information internationally to the members of international science organizations through the ICASE listserv, newsletter and peer-reviewed ICASE journal;
- collaborative funding opportunities to promote science education at regional levels; and
- organization of ICASE World Conferences, regional events, and workshops providing opportunities for professional development and networking.

How are your membership fees put to use?

ICASE membership fees are used for financial support of regional activities. Approval for funding will be considered based on a written submission (request for funding support) to the ICASE secretary, which clearly indicates how the activity meets the following criteria. All financial support for activities will be approved by the ICASE management committee, in consultation with the Executive Committee, and is subject to the availability of funds (generated by ICASE membership fees).

Procedure to request financial support of regional activities

1. The applicant organisation must be a current financial member of ICASE.
2. The activity must promote science education at a regional level.
3. The applicant organisation should provide a description of the activity and the potential benefits (including the extent of benefits - number of beneficiaries, and how the activity meets the short-term and long-term goals of promoting science education in that region).
4. ICASE must be acknowledged as a sponsor on all publicity material, including the website advertising the initiative. The ICASE logo must be displayed on all materials associated with the funding.
5. Funding requests will be accepted for the following range in US dollars: $500 – $2,000. These funds are intended to cover special initiatives associated with activities occurring in benefit of each region.
6. The applicant organisation must provide a budget for the activity including other sources of funding.
7. The applicant organisation must have an institutional bank account for the transfer of funds.
8. The applicant organisation must nominate a person in their organisation who will take responsibility for the activity, all expenditures and reporting (via presentation and in writing) at the subsequent World Conference.

The report may be presented via video conferencing if the organization is unable to fund a member to attend an ICASE World Conference. Please note that the ICASE Management Committee reserves the right to approve funding for second and subsequent applications from the same region within a three-year period, even when the application may come from a different organisation.

BECOMING A MEMBER ORGANISATION

ICASE invites national, sub-national and multi-national organisations interested in the promotion of science and technology education to join its worldwide network. Organisations eligible to join are Science Teacher Associations (STAs), Science Societies, Institutes, Universities (or University Departments/Faculties), Industries, Companies, Centres and Museums. These organisations may have a sole interest in science education (or in one of its sub-disciplines such as biology, chemistry, physics, Earth sciences, etc.) or have wider interests, one of which is science education. Following the ICASE Constitution, requests for new members, whether full or associate, are approved by the ICASE Executive Committee.

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- to disseminate information internationally to the members of international science organizations through the ICASE listserv, newsletter and peer-reviewed ICASE journal;

- to obtain collaborative funding aimed at promoting science education at regional levels; and
- to participate in ICASE World Conferences, regional events, and workshops providing opportunities for professional development and networking.

In addition, ICASE member organizations and their representatives receive reduced conference registration fees for attendance at all ICASE World Conferences. http://www.icaseonline.net/membership.html

The Fifth Science Education Forum, Academic Divisions of Chinese Academy of Sciences (CASAD)

"Science Education Amid COVID-19: Problems and Enlightenment"

Prof. Jianzhong Zhou, the Organizing Co-Chair of the 5th Science Education Forum, invited ICASE President Dr/Prof. ZHANG BaoHui for a talk on forum theme "Science Education under the Influence of COVID-19: Problems and Implications." Prof. ZHANG accepted the invitation and participated in the forum with other international and Chinese speakers, such as Prof. Keith Taber, University of Cambridge, UK; Prof. Zhenguo YUAN, East China Normal University; and Dr. Philippe Pypaert from UNESCO. Prof. Zhang delivered a talk entitled *''The Challenges and Opportunities of Online Science Education at K-12 Level during COVID-19 and Beyond.''* The forum was held in Shanghai, China on 29 October 2020.

The 5th Science Education Forum was co-hosted by the Science Popularization and Education Committee Academic Division of the Chinese Academy of Science (CASAD), Institutes of Science and Development, Chinese Academy of Sciences (CASISD) and East China Normal University. A total of 71 experts participated from around the world. Domestic experts including ICASE President Dr/Prof. ZHANG BaoHui participated on-site and international experts participated online using Zoom software, with discussions occurring in English.

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Experts participated on-site in the Forum

Prof. Zhang presented at a panel on science education during and after the COVID-19 pandemic

ICASE president Dr. /Prof. ZHANG BaoHui's participation in the 5th Science Education Forum will bring in a good collaboration opportunity with the Chinese Academy of Science (CAS), Institutes of Science and Development. CAS (http://english.cas.cn) has been the key to China's S&T planning.

Prof. Zhang is asking a question

ICASE President Prof. ZHANG BaoHui Presented at Japan Society for Science Education (JSSE) 2020 Annual Meeting

Dr. Manabu Sumida
Professor of Ehime University
Japan Society for Science Education
Asia Regional Representative, ICASE

The 44th Annual Conference of the Japan Society for Science Education (JSSE) was held for three days from 25-27 August 2020. This year's conference was originally scheduled to take place in Himeji City, but was held online due to the COVID-19 pandemic.

The keynote speech and science education research seminars were delivered via video recordings, and the symposium proceedings, group panel presentations, general research presentations, and interactive sessions were published to the web. There were 312 participants and 219 presentations in all.

The JSSE International Exchange Committee holds an international luncheon meeting every year during the annual conference. This is an event where participants who have experience attending international conferences and are interested in global science education research gather to have fun and exchange information. We also provide information, such as participation reports, share experiences gained at international conferences, and offer tips for presentations in English. This year, the luncheon meeting was cancelled. During the conference, however, **Dr. /Prof. ZHANG BaoHui** delivered a video message titled "ICASE: A Global Network for Science and Technology Education."

Collaboration with ICASE is clearly emphasized in the JSSE member regulations (http://www.jsse.jp/jsse/modules/note0/ ; http://www.jsse.jp/jsse/modules/note1/index.php?id=25), and further cooperation for mutual benefit is expected in the future.

The 45th conference of JSSE will be held at Kagoshima University from 20-22 August 2021. We look forward to your participation.

Australasian Science Education Research Association's (ASERA) Annual Conference2020

ASERA holds first-ever online conference in 2020

Wendy Nielsen, University of Wollongong
Helen Georgiou, University of Wollongong
David Geelan, Griffith University
Angela Fitzgerald, University of Southern Queensland

Like most other large (or small) gatherings around the world in 2020, the Australasian Science Education Research Association's (ASERA) annual conference could not take place in its usual face-to-face manner due to COVID-19 and related travel restrictions. A late decision to quickly move to a low-cost online format for the conference held in late June 2020 gave us pause to consider how our usual scholarly activities could be promoted and maintained in the 'new norm' post-pandemic. Feedback from participants on the online conference experience was very encouraging with regard to our efforts to offer 'live' sessions alongside asynchronous components. These included pre-recorded talks by paper presenters with scheduled times in the conference program to watch them followed by live Zoom discussions. Posters were available throughout the conference in a dedicated space on the conference homepage and feedback to poster presenters was encouraged. A number of other live events (via Zoom) were scheduled: an opening cocktail reception, ECR Fireside Chat, two symposia, AGM, lunch-time drop-ins and a closing session. Our experiences have opened up new conversations within the organization about how to fruitfully engage conference participants around the world who would not normally travel to this F2F conference and how to reduce our collective environmental footprint as we engage with colleagues in our professional associations.

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National Recognition of Research in Science Education

Joanne Burke
ASERA Executive Officer
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Professor David Treagust, PhD, from Curtin University, Western Australia has recently been recognized for his lifetime contribution to research in science and engineering education. This award identifies the top 40 researchers in Australia across eight disciplines. Dr. Treagust was one of 5 researchers in the area of Social Sciences based on the number of publications and citations. His research interests include understanding students' ideas about science concepts and how these ideas relate to conceptual change and multiple representations, the design of science curricula and teachers' classroom practices.

Professor David Treagust has been a constant and active member of ASERA (Australian Science Education Research Association) for more than 20 years. He has provided great support for other science education researchers and is highly valued in our community. Congratulations, David!

https://specialreports.theaustralian.com.au/1540291/9/

News from Member Commonwealth Association of Science, Technology and Mathematics Educators (CASTME)

Dr. Sue Dale Tunnicliffe
CASTME, United Kingdom
E-mail: lady.tunnicliffe@mac.com

CASTME has instituted a Facebook and Instagram page for mothers, careers and communities on everyday STEM. And is producing a regular newsletter of simple activities providing foundation and consolidating experiences which we now recognise as vital for developing STEM CAPITAL. CASTME has published the following aims in line with UNESCO and the Commonwealth Sustainability Goals.

It also recognizes the paradigm shift in education recognizing the importance of formal early years and pre formal school experiencers in play and everyday tasks. Such recognition also empowers women.

CASTME AIMS 2020

•CASTME contributes to the delivery of the Sustainability Goals

•CASTME connects educators, in the widest sense, of all ages, in both formal and informal settings throughout the Commonwealth and beyond. CASTME recognizes that learning is Lifelong and takes many forms.

•CASTME actively promotes the importance of both community and family as the foundation of a young child's learning and promotes the importance of science, technology, engineering and maths (STEM) in everyday lives.

•CASTME promotes projects which address the social and human context of science, technology, engineering, and mathematics.

•CASTME recognizes the crucial role of literacy in science, technology, engineering and mathematics (STEM) in the delivery of the Sustainable Development Goals (SDGS) towards achieving the sustainability of our planet, encouraging the development of critical thinking, problem solving and communication starting with early years and their mothers/careers through youth to citizens.

Announcement

ICASE now has an Early Years committee. Anyone interested in this please contact the Chair Dr. Sue Dale Tunnicliffe with suggestions.

STEM@sdtunnicliffe.ac.uk

UNESCO NEWS

In partnership with UNESCO

United Nations Educational, Scientific and Cultural Organization

Information compiled by Dr. Teresa Kennedy
ICASE Representative to UNESCO

From the Collective Consultation of NGOs on Education 2030 (CCNGO)

Youth, Education for Sustainable Development and Resilience: Empowering young people mobilizing beyond the crisis

The COVID-19 crisis is only one of many crises that we are facing and will be facing in the coming years. Particularly in context of the climate emergency and extreme weather conditions, the global community will have to deal with new and unexpected situations and learn to live with ambiguity and uncertainty. More than half of young people also expressed concerns about mental health linked to the current sanitary crisis as well as the concerns on education and employment.

This online workshop explored what would help young people to feel better prepared for the current and future uncertain situations. Discussions addressed the following questions: How do young people view the current crisis? What are the enabling conditions for young people to become active change agents for sustainability? How can ESD equip young people with knowledge, skills, values and attitudes to be resilient under challenging situations? More information about the results will be available soon. For more information see: https://gpsen.org/event/youth-education-for-sustainable-development-and-resilience/

UPCOMING ESD WORKSHOPS

For a list of upcoming workshops see:
https://en.unesco.org/themes/education-sustainable-development/ESDfor2030-workshops

Example Workshops:

Workshop #4 - ESD and global health: Inter-linkage of the health of people and the planet. 9 December 2020, 12:30 GMT+1 (Paris time). This online workshop focus on the interconnectedness of the health of people and planet as highlighted through the COVID-19 pandemic, and questions how this can be better reflected in ESD practices

UNESCO News Cont.

Workshop #5 –

ESD and Climate Emergency: "Bend the curve for climate change." This online workshop raises the parallels between the pandemic and climate emergency and discusses how the lessons learned from the public response to the COVID-19 crisis can help flatten the curve on climate change, in particular through ESD's contributions.

ESD for 2030 Roadmap launches with a series of regional events

UNESCO is organizing regional online launch events of the ESD for 2030 Roadmap which provides guidance for Member States and other stakeholders for the implementation of the new global framework **'Education for Sustainable Development: Towards achieving the SDGs' (ESD for 2030):**

- **Asia and the Pacific:** Thursday 19 November 10:00 – 11:15 (Paris time) - Register
- **Latin America and the Caribbean:** Friday 20 November 16:00 – 17:15 (Paris time) Register
- **Arab region:** Tuesday 24 November 15:00 – 16:15 (Paris time) Register
- **Africa:** Thursday 26 November 12:30 – 14:00 (Paris time) Register
- **Europe and North America:** Tuesday 1 December 15:00 – 16:15 (Paris time) Register

UNESCO-Equatorial Guinea International Prize for Research in Life Sciences

The UNESCO-Equatorial Guinea International Prize for Research in the Life Sciences rewards significant efforts of individuals or institutions through scientific research towards improving the quality of human life.

Life sciences hold the key to a better future, as they contribute to poverty eradication, improved health, food and water security. The core objectives of the Prize is to encourage research, enhance collaboration amongst researchers and reinforce networks of centres of excellence in the life sciences towards these goals.

The Prize, funded by the Republic of Equatorial Guinea, is given annually to a maximum of three laureates. They receive a monetary award of USD 350,000, divided equally among laureates, to help further their research, together with a certificate and the "Integracion Tribal" statuette by Equatorial Guinean artist Leandro Mbomio.

UNESCO News Cont.

The Prize was established by UNESCO's Executive Board, to support the achievement 2030 Agenda for Sustainable Development as well as UNESCO's global priorities included in the Medium-term Strategy 2014-2021.

The call for applications is open until 20 December 2020.

For more information see: https://en.unesco.org/stem/lifesciences-prize

UNESCO-King Hamad Bin Isa Al-Khalifa Prize

The 2020 edition of the UNESCO King Hamad Bin Isa Al-Khalifa Prize for the use of Information and Communication Technologies in education are now open.

Funded by the Kingdom of Bahrain and established in 2005, the Prize rewards projects that use new technologies to enhance teaching, learning and overall education performance.

The theme of the 2020 edition is **"The use of Artificial Intelligence to enhance the continuity and quality of learning".**

Two awards will be granted, and each recipient will receive a monetary award of **USD 25,000** during the Award Ceremony at UNESCO Headquarters in Paris.

UNESCO News Cont.

For more information see:
https://en.unesco.org/news/unesco-prize-use-ict-education-call-nominations-now-open-projects-ensuring-continuity-and

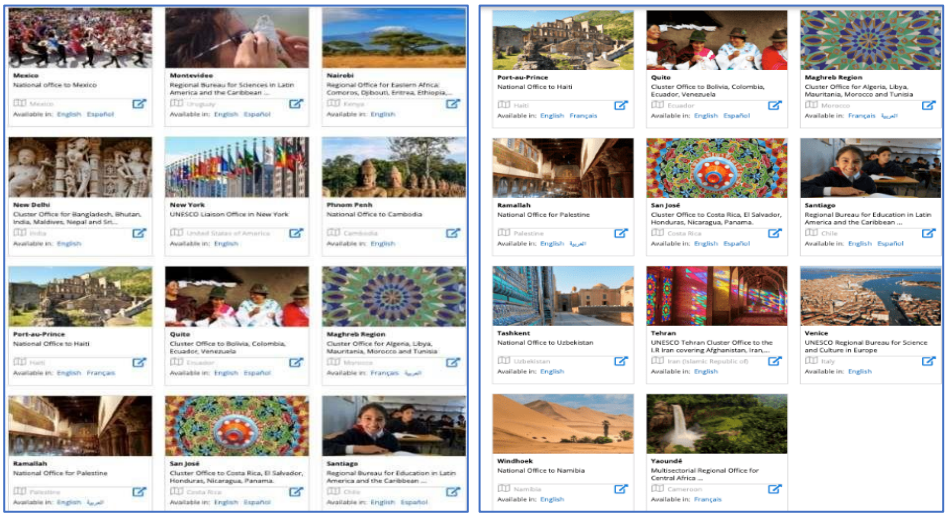
For more information see:
https://www.unescogreencitizens.org/

UNESCO FIELD OFFICES

Through its field offices, UNESCO develops strategies, programmes and activities in consultation with national authorities and other partners. UNESCO also operates a number of specialized institutes and centres. Check the list below to see the location of the UNESCO Field Offices.

For more information see:

https://en.unesco.org/fieldoffice?field_country_reference_target_id=All



For all UNESCO Offices by Region see: http://www.unesco.org/new/bfc/all-offices/

Daylighting Rivers project – the European Educational Experience for Rivers' Knowledge

Authors: Francesca Ugolini, Bulent Cavas, Demetris Mylonas, Serena di Grazia, Vincenzo Striano

The European project "Daylighting Rivers: science education for civic ecology" (2017-2020), cofounded by EU Erasmus+ Program, is getting close to the end. During the course of the project, more than 200 secondary school students and 20 teachers from Italy, Greece, Spain and Turkey have been involved in multidisciplinary activities regarding rivers in their area, a town or a province. "Daylighting" is a concept used to represent the process by which rivers that have been covered over due to accelerated urban development and flow underneath cities, are uncovered and re-exposed to the environment. Daylighting rivers means also discovering and investigating the human threats on our rivers and acquaint higher awareness about land protection and sustainable development. "Daylighting Rivers" puts the threats at the center of investigation, and engages students in studying changes that have been made to the urban land cover, rivers that flow through the city, pollution due to human activities and river management.

A collection of 20 learning units, developed and tested by teachers and students, can be downloaded for free from the project website www.daylightingrivers.com. These units represent a step-by-step guide for teachers who would like to implement a river study with their students, following an inquiry-based approach. The learning units include an introduction to the topic, a series of activities following the IBL cycle methodology and worksheets for students.

In addition, "Daylighting Rivers" fosters the use of technologies either for representing geographic information in maps, either for raising awareness in young generations. Geographic information systems and apps for location-based games (LBG) have been promoted and used in the project. The innovative LBG combine virtual information and interaction in a real place or environment (called augmented reality) and are played on mobile devices with GPS and internet. Location-based gaming offers great educational possibilities, as it allows educators and facilitators of learning to create constructivist experiences rich in educational content. LBGs have another important feature, which makes them valuable for education: they connect places and stories. In a LBG, it is possible to embed extra layers of information and narratives about, for example, the route of an urban river or other locations of environmental importance. By visiting real places, the story becomes a personal experience linking physical objects with learning content. This conveys to the player location-specific knowledge, which is easy to remember, exploiting the connection between the real world and the game.

The implementation of the project by the piloting classes was assessed in terms of perceived changes in knowledge, skills, interests and attitudes regarding the topics of the project and attitude and effectiveness of the learning methodology. A specifically developed questionnaire was administered to the students at the end of piloting and the analysis of the responses found out how the students from Greece, Spain and Turkey demonstrated a relatively low awareness regarding the rivers/streams in their town, but in general the activities performed during the project increased their knowledge on basic concepts and on certain aspects like pollution and ecology of rivers in relation to other important aspects like the impact of climate change.

The level of knowledge of students on issues related to covered rivers appears to be substantially lower than their level of knowledge on issues of open rivers. Students appreciated learning methods such as project work in a team and fieldwork which are included in the Inquiry-Based Learning methodology proposed by the project, while the use of digital tools is lower. The implementation increased students' positive attitude towards aspects of science and technology although around 45% students in total and similar proportions in each country, consider science in school difficult subject.

"Daylighting Rivers" will celebrate its end on December 1 and 2, 2020 in a final international conference "Daylighting Rivers: Inquiry Based Learning for civic ecology", to be held in Florence (Italy) and online. The conference will host the ceremony for prize award of the international competition "Youth in Action for Daylighting Rivers". The competition has further increased the number of project users and followers and has been a way to increase students' awareness and active participation for helping their river.

More information about project materials and for participating in the next events, visit

www.daylightingrivers.com

WaterSTEAM - Landscape, water and active citizenship: a nature-based STEAM teaching methodology

Authors:

Demetris Mylonas, Bulent Cavas, Serena di Grazia,

Vincenzo Striano, Francesca Ugolini

Schools are on the frontline in developing basic skills and key competences related to STEM education. However, the latest results of the OECD assessment programme PISA for 2018 show that the issue of under-achievement of 15-year olds in STEM is more pertinent in South and Eastern European countries, which score below the EU average. Moreover, further studies reveal a gender gap regarding STEM education, where boys seem to be more engaged and perform better than girls. The European Commission has recognized that STEM subjects cannot be viewed in isolation, but need to be combined with environmental and socio-economic developments, and has adopted two policy documents on schools and higher education that expand STEM into STEAM, adding an "A" for "Art".

The WaterSTEAM project, funded through the Erasmus+ Programme of the European Commission, brings together research organizations and secondary schools from Italy, Greece and Hungary, as well as ICASE, in a consortium that proposes the development of an innovative and integrated learning methodology for secondary school education, adopting an inquiry-based, student-centred and interactive STEAM approach integrated with social and civic awareness, encouraging students to fully participate in social and civic life. The proposed learning methodology requires STEAM subjects to be embedded into their social and cultural context, incorporating students' experiences with global issues like environmental concerns, developing their critical thinking skills and social responsibility. In the WaterSTEAM context, Art is equally integrated with the STEM disciplines and goes beyond the traditional definition (e.g. visual arts) to include the humanities (i.e. disciplines such as history, sociology, literature, language study and human geography). Moreover, the methodology integrates the use of digital tools, especially Augmented Reality (AR) tools suitable for connecting learning material to the real world around us.

The theme chosen for pilot-testing and refining the proposed WaterSTEAM methodology is European Landscape and the role of Water in shaping it. As a reflection of European identity and diversity, the landscape is our living natural and cultural heritage. The European Landscape Convention (2000) stimulates the European states in active participation in improving the knowledge about landscapes, their characteristics and the forces transforming them. Water, in addition, is essential for life, and it has a constant impact on the environment, both directly and indirectly. There is a direct relationship between water and human behaviours, which are often the main reason behind the waste of this natural resource. The project focuses on how water can transform the landscape, applying a multidisciplinary methodology of investigation, consistent with the Landscape Convention and in line with the values of UN's 2030 Agenda. The theme provides a most suitable context for STEAM learning by relating it to global issues (e.g. climate change, green economy, renewable energy).

The objectives of WaterSTEAM are:

- To help teachers acquire skills and competences necessary for applying an integrated STEAM methodology, through an inquiry-based approach combined with AR tools. Teachers will be trained in using the learning methodology, AR tools and a collaborative implementation framework, and pilot test it in school.
- To develop a teaching and learning methodology for secondary school educators, adopting the STEAM approach and linking it to promoting active civic engagement, integrating Art creative learning and citizenship education to other major school subjects, addressing at the same time the gender barrier in STEM education.
- To enhance the above methodology with features of experiential learning, by bringing the student out in nature and providing the appropriate tools for the identification and documentation of real-world phenomena.
- To integrate Augmented Reality (AR) tools necessary for implementing the methodology, adding valuable elements to promoting civic awareness and dialogue between different groups in the community
- To encourage teachers to collaborate with their colleagues from a wide range of disciplines (science, technology, math, engineering, art, history, sociology, literature, languages) and develop a well-rounded interdisciplinary approach in teaching
- To raise the teachers and students' awareness about the importance of European landscape as natural and cultural heritage, the value of water and the importance of global environmental issues on a local level
- To create a practical Handbook for teachers of secondary education with step by step guidance on applying the proposed methodology and tools, and recommendations for its optimal integration in different educational systems

In this effort, the role of stakeholder organizations (i.e. the education community, decision makers at local, regional and central level, higher education and research institutions, and the civil society active in the fields of education and the environment) is key and goes beyond their support and networking to include their actual contribution to the learning process as external experts.

For more information on the project and to follow the project activities, please visit the project website at www.watersteam.eu and follow the WaterSTEAM page on Facebook.

Safety News: Practical work during the Covid-19 Pandemic

Bob Worley - CLEAPSS,
Chair of ICASE Safety Committee

Schools and other educational institutes in the world are now having to teach with an added safety problem, the COVID-19 virus. What options are open to schools and other educational establishments that include practical work in their curriculum?

Close schools completely

This was required in the first wave (March 2020) of the pandemic in the UK and many other countries. The total lockdown affected students taking our National exams in June. The attempt to award grades via algorithm caused a huge outcry and the decision was reversed; school estimates were accepted. Keeping children at home affects their education and social skills. Some parents realised how difficult it was to teach. However, our economy relies upon parents working and nothing was happening. Many schools and teachers attempted online instruction. It has worked where the student and teacher are motivated but access was difficult. Some homes did not have a laptop from which the student could work. The internet coverage is poor in remote areas of the UK. Teaching via Zoom and other online methods is mentally very exhausting for both the student and the teachers.

Open schools with added restrictions

It became apparent that educational centres do need to open. The economy has to be restarted as much as it possibly can. The students returned in August and September 2020, but at the same time, the second rise in infection is occurring.

Various strategies are in place in our schools because much relies on the physical layout of the school and the age range of students. This winter of 2020/21 is going to be difficult for teachers, students and technicians. There are many aspects to discuss but for science and DT teachers there is an added topic to manage.

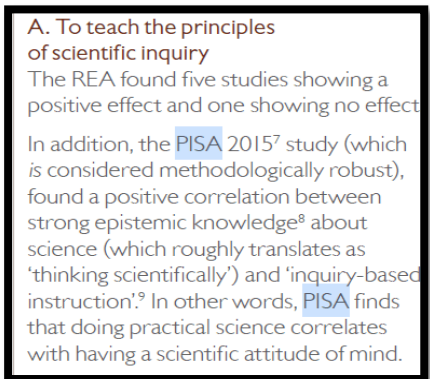
Is practical work possible? "No!"

This is one response. After all many countries do no practical work in their science syllabuses. This may be through the cost and availability of specialised rooms and teachers. It is claimed by some that science can be taught with videos and simulation exercises. You can show videos but make sure they are from a reputable source like your Country's Chemistry Society or Science Education Organizations. Just going to YouTube is not the answer because many are videos show very unsafe practices and are there to entertain, not to teach.

A flippant remark says that practical work not required to score well in PISA tables (which to some is all that matters). In a survey by the Gatsby Foundation from the UK found the following statement. Although this was a UK project, the brief was to examine practical work worldwide; a subject never looked at before. Reading the PISA report more carefully shows the following.

The Association for Science Education has recently provided a second report on practical science in the last few weeks. https://www.ase.org.uk/civicrm/mailing/view?reset=1&id=929

"Yes" To deliver practical work, Teachers cannot carry on as they did before. It is impossible, at least until we obtain more information from the scientists as to how low long the virus can still be active after settling on various surfaces, such as paper, metal and plastics. All the advice is based on previous COVID viruses.



A. To teach the principles of scientific inquiry

The REA found five studies showing a positive effect and one showing no effect

In addition, the PISA 2015[7] study (which *is* considered methodologically robust), found a positive correlation between strong epistemic knowledge[8] about science (which roughly translates as 'thinking scientifically') and 'inquiry-based instruction'.[9] In other words, PISA finds that doing practical science correlates with having a scientific attitude of mind.

You have to consider the transmission of the virus between student/student and adult/student, from home to school (including the school bus), within the school and then back home again.

It will require teachers to limit the amount they do as a student practical and add to it with a demonstration. Careful use of video and simulation can be used. But make sure these are from a reputable source. Many YouTube videos are for entertainment, not teaching. Cries to the teacher of "Can you do that?" have resulted in profoundly serious incidents. On a personal note, teachers are taking a greater interest in microscale chemistry which I have developed at CLEAPSS.

In UK schools there is 2m social distancing of the teacher from the student which adds to issue. All I can say is that teachers in the UK are doing practical work in their lessons. And, if your government allows, so can you.

Extra Work

There is extra work, mainly in how equipment is dealt with after the students have used it. One route the virus can take is via the eyes so the cleaning of eye protection after use has to be (in the words of the Dept. for Education in England, "meticulous". You will find our advice from CLEAPSS in the section below. Schools in the UK are fortunate to have technicians and they are carrying the burden of this extra work. I assume that schools without technicians provide teachers with extra time for preparations but I may be very wrong there!

Information

What I think ICASE can do, is to pass the information around that we have within our countries. As I have said before in the Newsletter, there is no way ICASE can be a judge. Each country has its safety laws. They may even be different between different States/Provinces/Departments/Counties. Even within the UK, the law and advice differ between England and Wales, Scotland and Northern Ireland.

So teachers must follow their employer's rules and regulations about practical work. CLEAPSS[iii] in has made available all our information. But please realise that it is continually being updated.

GL336 - CLEAPSS Advice during the COVID-19 / Coronavirus Pandemic

GL338 - Practical activities for pupils attending school during extended periods of closure

GL339 – Practical activities for pupils at home during extended periods of school closure

GL343 – Guide to doing practical work during the COVID-19 Pandemic – Science - Ver. 2.06

GL345 – Guidance for science departments returning to school after an extended period of closure

GL352 - Managing practical work in non-lab environments (COVID-19 pandemic)

GL353 - Guidance for schools where pupils spend all day in a lab (COVID-19 Pandemic)

Ken Roy in the USA has provided connections to 2 podcasts

"Safety Precautions in STEM Learning During COVID" – 17 Sept 2020 Education Talk Radio interview with Dr Ken Roy, Glastonbury Public Schools (Connecticut) Director of Environmental Health & Safety and National Science Teaching Association (NSTA) Chief Safety Compliance Adviser. The focus of this interview reviews important safety precautions/protocols during COVID for science, STEM, Technology Education/Engineering academic laboratories:

https://www.blogtalkradio.com/edutalk/2020/09/17/safety-precautions-in-stem-learning-during-covid

Laboratory Indoor Air Quality & Safety" – NSTA Safety Blog October Commentary by Chief Blogger Dr Ken Roy. Critical information on your lab's Heating, Ventilation and Air Conditioning system during the COVID Pandemic!!! Go to:

https://www.nsta.org/blog/laboratory-indoor-air-quality-safety

Finally

We cannot be the only countries addressing this issue. Surely other organisations are dealing with this issue on a National basis. I know many of your reading this, are not involved in safety, but if you carry out any practical work, you ought to know someone who does. How do you know what you are recommending to teachers and lectures is safe?

To collect a list of like-minded individuals in countries around the world to exchange information would be invaluable.

Footnotes:

i-https://www.gatsby.org.uk/education/programmes/support-for-practical-science-in-schools

ii-https://www.ase.org.uk/sites/default/files/GoodPracSci%20-%20Benchmarks%203.0.pdf

iii-http://science.cleapss.org.uk/

Up Coming Events

Daylighting Rivers Final Conference 2020

DAYLIGHTING RIVERS
SCIENCE EDUCATION FOR CIVIC ECOLOGY

Co-funded by the Erasmus+ Programme of the European Union

Teachers, researchers, professionals and academics with an interest in educational methodologies, are invited to present results of their experiences and researches.

December 1-2, 2020

The conference is organized in the framework of the Erasmus+ project Daylighting Rivers, c-funded by European Union. Daylighting Rivers engages secondary school students in hands-on, interdisciplinary IBL methodology under a STEM approach, focusing on land and river use and transformation, with an emphasis on the ways in which urban growth impacts local river ecosystems.

With urban river ecosystems as a central focus, the conference will encourage discussion on:

- ✓ Pedagogical and technological innovation in STEM and environmental education; the use of new media
- ✓ Environmental education and civic ecology
- ✓ Urban rivers and rivers as laboratory for science and environmental education
- ✓ Social networks and learning communities as agents of environmental education
- ✓ Geographic Information tools and studies
- ✓ Game Based Learning and Location Based Games

The conference is a two-day event with parallel sessions. Although the conference will take place mainly online, it will be based in Florence, in the prestigious Palazzo Vecchio

Participation in the conference is free of charge. Participants will receive also the Book of Papers published in digital format with ISBN.

The programme is available at:

https://www.daylightingrivers.com/final-conference/

Registration is welcome for organizational reasons at:

https://marliber.wixsite.com/final-conference-dr/registration-fees

2021 International Conference

Science Education Elevated!

Join the Association for Science Teacher Education (ASTE) Online Conference: 14-21 January 2021

The leadership of ASTE has determined that the conference will be virtual for 2021. Details and registration information will be available soon. Check out the **2021 ASTE Conference at a Glance:**

https://theaste.org/wp-content/uploads/2020/01/2021-ASTE-Conference-at-a-Glance.pdf

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nsta
National Science Teaching Association

Rising to the Challenge: Creating Equitable Opportunities During a Remote Learning Environment….and Beyond

Virtual Miniseries

December 5 · December 12 · January 16 · January 23

Join NSTA for this special four-part, interactive, virtual miniseries, which is jointly hosted by the Association for Multicultural Science Education (AMSE) and NSTA's Committee on Multicultural / Equity in Science Education. Taking place in December and January, this miniseries is your source for the resources and best practices you need to support distance learning, in-classroom instruction, and hybrid teaching to specific student populations.

Register by 20 November 2020 for Early Bird Pricing
For more information see: https://www.nsta.org/rising-challenge

ESERA Conference, 2021, Braga, Portugal

The 14th Conference of the European Science Education Research Association (ESERA 2021) will be held in Braga, Portugal, from 30 August to 3 September.

https://www.esera.org/conference/33-conference/830-esera-conference-2021-praga-portugal

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COVID-19 ENGINEERING DESIGN CHALLENGE

The University of Texas at Tyler University Academy is a system of K-12 STEM Lab Schools located on 3 separate campuses in East Texas (USA). Our students are participating in a COVID-19 Engineering Design Challenge, in collaboration with the Texas STEM Coalition (T-STEM) and the International Council of Associations for Science Education (ICASE). We invite you and your students to join us. **Over 100 students from 5 countries have participated in the 2020 challenge (Argentina, the Dominican Republic, Peru, Russia, and the US).** **Join the 2021 Challenge!**

The project webpage contains teacher instructions as well as a sample student handout translated in the six United Nations (UN) languages (Arabic, Chinese, English, French, Russian and Spanish), plus Japanese, Portuguese and Turkish.

For more information see: **The COVID-19 Engineering Design Challenge**
or click on the direct link at https://uttyler.az1.qualtrics.com/jfe/form/SV_eXILiS0zOZ2pAnb

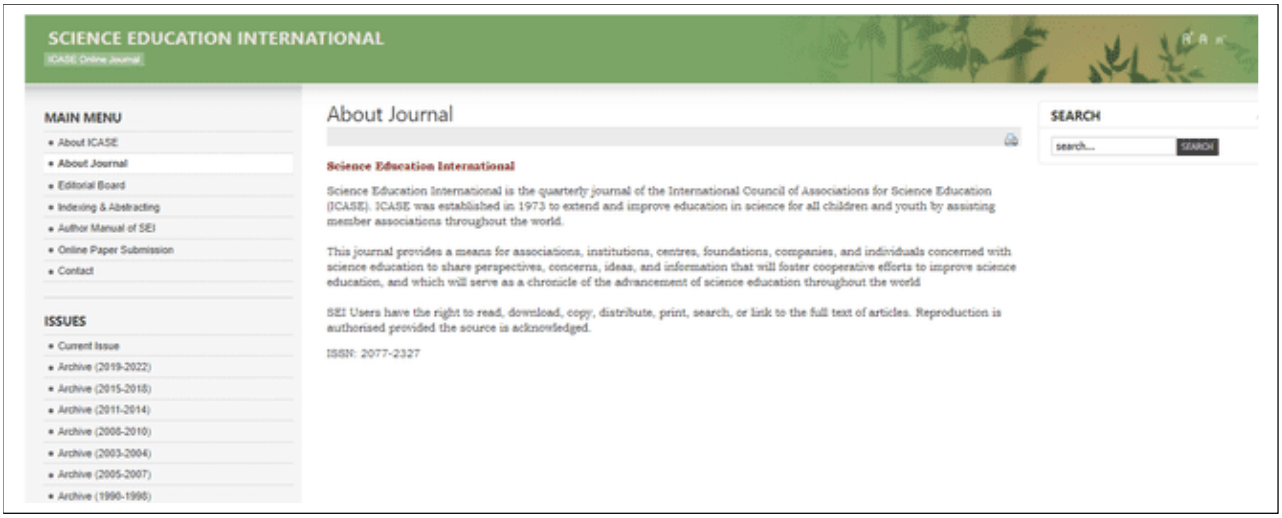
ICASE Journal - Science Education International

Steven Sexton, Editor

Science Education International journal is now included in the DOAJ (Directory of Open Access Journals) after a ten-year break.

The latest issue (Volume 31, Issue 3) published in September has been uploaded to DOAJ and I will work on uploading the previous issues over the next several weeks. As each new issue is published these articles will also be added to DOAJ.

Once we have the back issues in the DOAJ index, we will investigate getting into the Social Sciences Citation Index (SSCI) index. Our journal continues to grow and build on the previous work done by the past editors and it is due to the work of Dr. Bulent Cavas and Dr. Zhang BaoHui that we are now back into the DOAJ and looking forward to the SSCI.



A major attraction of SEI is that there is no payment for those wishing to publish in the journal. And ICASE welcomes submissions by teachers, higher degree students or science educators in general from around the world. ICASE will do its best to assist authors whose native language is not English.

Before making a submission, please consult the Author's Manual for SEI located at www.icaseonline.net/seiweb for information related to the following topics:

(a) Copyright (b) Plagiarism (c) Language
(d) Material submission (e) Formatting (f) Artwork & Photos
(g) The Review Process (h) Non-native English authors

And we very much appreciate referencing articles previously published in SEI in your submissions.

ICASE also welcomes new reviewers. If you are interested please contact **Dr. /Prof. ZHANG Baohui**, Chair, ICASE Research and Publications Standing Committee at icase2017bhzhang@163.com .

ICASE Executive Committee 2020-2023

ICASE membership spans the world led by an Executive Committee, with a Management Committee (President, President-Elect, Immediate Past President, Secretary, and Treasurer) responsible for the day-to-day administration and working closely with Appointments Co-opted to the Management Committee, Regional Representatives, and Chairs of Standing Committees. Presidential terms are noted below.

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