



INTERNATIONAL COUNCIL OF ASSOCIATIONS FOR SCIENCE EDUCATION

Kuching Declaration on Science and Technology Education

The ICASE World Conference on Science and Technology Education was held in Kuching, Malaysia 29 September - 3 October, 2013. We, the conference participants from 34 countries, believe that Science and Technology Education at all levels should prepare students for their future lives as global citizens.

Access to high quality education is a fundamental right for all. In times of global vulnerability, issues such as sustainability, health, peace, poverty alleviation, gender equity and biodiversity conservation need to be at the forefront of thinking, planning and actions related to strengthening Science, Technology, Engineering and Mathematics (STEM) education. While the relative balance and emphases of these disciplines varies around the world, it is the interrelatedness and combination of these that will propel progress.

Planning and implementing effective STEM education includes an emphasis on the development of life competencies such as evaluative inquiry, problem-solving and decision-making skills, and working collaboratively in teams. The development of confident life-long learners with skills and attitudes to thrive in complex societies is a high priority. Implementation efforts should make health, safety and environmental sustainability an integral and important part of education. Social responsibility should be established as an educational goal for all. Education is essential for Sustainable Development.

The conference participants call upon all involved in research, policy development and the teaching of STEM disciplines to carry out their roles actively in implementing this Declaration in their regions of the world, acknowledging the key roles of teachers.

We resolve that:

1. Learning through STEM disciplines should prioritize activities and content that are relevant to children's worlds, including their environment, communities, resources, cultures and interests.
2. Learners can be activated through a range of pedagogical approaches that provoke meaningful thinking about scientific issues from a young age to help them develop social responsibility.
3. The quality of teachers of science and science teaching is paramount. Opportunities for ongoing teacher professional learning through collaboration are critical.
4. ICASE through its members and member associations will create opportunities for teachers of science at all levels to be involved in collaborative feedback opportunities to benefit from lessons learned internationally.

5. High quality teacher education programmes should model evidence-based practice where teachers of science use evidence of student progress to adapt and modify what they do.
6. Science Teachers Associations are encouraged to form in all nations. They should take responsibility for representing teachers' and students' voices and needs in science, STEM and sustainability education at all levels.
7. Member organizations of ICASE will support joint initiatives to develop quality free online teaching resources. Associated workshops should support the development of innovative approaches to using ICT and utilize established resources developed by Science Teacher Associations around the world as well as UNESCO.
8. ICASE through its members and member associations will contribute to policy development and evaluation of the impacts of STEM education initiatives.
9. Policy should ensure investment in interdisciplinary sciences at all levels of education to provide sufficient numbers of science and STEM professionals and innovators.

Given the importance of environmental sustainability to the future of our planet, ICASE members also resolve to take action on the following:

1. Provide students of all ages with opportunities to experience and connect with the natural environment.
2. Promote a sense of care and shared responsibility for the Earth through STEM education about global issues and environmentally sustainable development principles.
3. Empower all students to develop the skills and attitudes to address issues and solve problems in their current and future lives.
4. Revise teacher education programmes to include critical thinking related to environmental and sustainability education that engages authentically with local communities.
5. Environmental sustainability programmes should take account of local and indigenous worldviews as well as science ideas.
6. Disseminate research information on the impacts of human activities on the environment, such as climate change and biodiversity, to better enable this information to be incorporated into STEM education.
7. Science education associations must prioritize environmental and sustainability education within their committees, support and opportunities that they provide.

ICASE acknowledges and appreciates the valuable input provided throughout the development of the Kuching Declaration on Science and Technology Education from our colleagues in the Science Education Thematic Cross Cutting Unit, Natural Sciences Sector at UNESCO Headquarters in Paris, and from UNESCO's Regional Science Bureau for Asia and the Pacific in Jakarta.