AEMASE and CESAME

AEMASE

AEMASE means “African European Mediterranean Academies for Science Education”. It is a network of academies of the African, Mediterranean and European (AME) region. Its objective is to share knowledge, strategies and means in order to improve the way science education is taught in the AME region. It has already held three international conferences:

- AEMASE I in Rome at the Nazional Accademia dei Lincei in 2014,
- AEMASE II in Dakar at the Académie Nationale des Sciences et Techniques in 2015
- AEMASE III in Paris at the Institut de France in 2017

Two key findings of AEMASE

The AEMASE network agrees on two key findings.

1. **The renewal of science education in schools** (including mathematics, technology and engineering) is critical to sustain economies of European regions and accelerate the development of African and Mediterranean regions.

   Indeed, in all countries, a quality science education will equip all children with adequate tools for a rational approach to situations, and prepare a sufficient number of scientific and technical staff while better including young girls in science.

2. **Inquiry Based Science Education (IBSE) programmes** are the best ways to it.

   It is unanimously recognized that a pedagogical approach where the teacher guides students to observe and measure by themselves, reason, make hypotheses, experiment and conclude, is the most fruitful one.

The French Minister of Education, M. Jean-Michel Blanquer, at the opening of the AEMASE III conference in Paris on October 3, 2017, with the Secrétaire Perpétuel of the Académie des Sciences, Professor Catherine Bréchignac on his right side, and the two Vice-Chairs of AEMASE and CESAME Professors Odile Macchi and Mahouton Norbert Houkonnou
The AEMASE Steering Committee

The AEMASE steering committee is chaired by the Indian Professor Krishan Lal, who is Co-chair of IAP for Science. The Vice-chairs are Professor Odile Macchi, Member of the Académie des sciences, France, and Mahouton Norbert Hounkonnou, President of the Benin National Academy of Sciences, Arts and Letters, Benin

Other Members:
Malik Ghallab, Member of the Académie Hassan II des Sciences et Techniques, Morocco
Friedrich J.W. Hahne, Member of the Academy of Sciences of South Africa, South Africa
Pierre Léna, Member of the Académie des sciences, France
Peter McGrath, Coordinator InterAcademy Partnership, Italy
David Rios, Member of the Royal Academy of Sciences, Spain
Maurice Tchuenté, Member of the Académie des sciences, Cameroon
Giancarlo Vecchio, Member of the Accademia Nazionale dei Lincei, Italy
Ahmadou Wague, Member of the Académie Nationale des Sciences et Techniques, Senegal

The AEMASE Steering Committee will also pilot the first phase of the CESAME project explained below

The AEMASE III Paris conference on October 3, 2017. Left: Professor Krishan Lal, Right the Italian Ambassador

CESAME, a field project, an emanation of AEMASE

CESAME means “Centres for Education in Science for Africa, the Mediterranean and Europe”. It is a field project concerned with the AME region

CESAME launching

A statement was overwhelmingly voted by the Paris AEMASE III participants
The CESAME project was launched by the overwhelmingly approved vote of the participants to AEMASE III conference on October 4, 2017.

Three basic principles of the CESAME field project

The CESAME project relies on three basic principles:

1. *A novel professional development possibility* should be proposed to school science teachers: volunteer training to the non-traditional IBSE way of teaching.

   This is best done during short, typically one week, sessions where science teachers, teacher educators and scientists cooperate and prepare for the students, hands-on experiments involving a scientific knowledge, as proposed by the French national programme *La main à la pâte* (meaning hands in the dough) or the British *Science Learning Centres*.

2. *The diverse educational experiences of the various countries* are an advantage

   This means to organize the first CESAME sessions as international meetings where scientists, trainers and trainees (teacher educators) come from the whole AME region.
3. **Involvement of the political education authorities of the countries**

While academies are very keen to renew science education in the IBSE approach, the decision makers are the Ministries of education. Therefore, a key factor for the success of the project involve is these Departments.

CESAME is but a seed project, while the renewal of science education along the above key findings and basic principles is a long-range task. Thus, the Education Department should be convinced that (i) such a renewal is feasible in their country and worth important efforts, (ii) the CESAME project can help launch it, (iii) their teachers and teacher educators will attend the IBSE CESAME sessions if encouraged to do so. Because of funding and cultural matters, this is a difficult challenge that the CESAME actors are aware of. Hence a modest prospect for the time: a one year phase 1 that will be followed by a two-year phase 2 if phase 1 is successful.

**CESAME first phase**

**French and Italian known institutions grant their support to a one year phase**

Phase 1 of CESAME is a one year pilot phase to demonstrate the adequacy of the three above basic principles. It was made possible thanks to the confidence and financial support of five institutions

- The Agence Française de Développement
- The Académie des sciences
- The InterAcademy Partnership (IAP)
- The Nazionale Accademia dei Lincei
- The Network of African Science Academies (NASAC)

**The La main à la pâte partnership**

The partnership of *La main à la pâte* is of major importance to allow implementation of phase 1 of CESAME, thanks to its internationally renowned IBSE expertise

**The three sessions**

1. **First session: Trieste, Italy, at the International Centre for Theoretical Physics, October 1 – 6, 2018**

**Title: Inquiry-Based Science Education, an introduction**

*Coordinator: Professor Joe Niemela, ICTP*
ICTP has held the first session because of its great international experience in North-South scientific cooperation. This first session has set the tone of the project by developing the core principles of IBSE. There were 20 trainees coming from Benin, Cameroon, Italy, Morocco, Tunisia and South Africa. The trainers were two experienced La main à la pâte experts, with the cooperation of the Italian teacher training association Associazione Nazionale Insegnanti di Scienze Naturali (ANISN) based in Naples (director Professor Anna Pascucci).

A follow-up of this session could be held within 18 months at ICTP with a focus on education to climate change since there is a team of the Intergovernmental Panel on Climate Change (IPCC) at ICTP.
2. Second CESAME session (bilingual English- French): Tunis, Tunisia
Location : ESPRIT (Ecole Supérieure PRivée d'Ingénierie et de Technologie)
January 20-26, 2019
Title: Climate change, solutions and education to sustainable development
(Changement Climatique - Solutions – Education au Développement Durable)
Coordinator: Professor Zohra Ben Lakhdar

The Tunisian ESPRIT is a high engineering College. It has a UNESCO chair and has been involved in several Problem/Project Based Learning UNESCO education projects for developing countries, especially active learning in Optics & Photonics. A local CESAME steering committee has been established under the lead of the Ministry of Education, including inspectors and pedagogical advisers in the fields of life and earth sciences, math, physics, computer sciences, languages, all with the IBSE pedagogy. The trainers will be a mixed team from the new Office of Climate Education (OCE, located in Paris) and from ESPRIT. All are experienced in IBSE and hands-on. While OCE is specifically expert about climate change, ESPRIT is specialized on sustainable development that is a topic on the agenda of the Tunisian curriculum. The level will be matched to students 12-14 years old. The schedule will be built up in a coherent and complementary cooperation between OCE and ESPRIT as follows:

OCE
a/ Climate change in itself (atmosphere, greenhouse effect, natural and anthropic phenomena)
b/ Housing and urbanism (renewable energies, use of soils, transportation)
c/ Biodiversity (if time allows: biodiversity services to mankind but affected by climate)

ESPRIT

a/ Light Emitting Diodes: replacing classic lamps they reduce energy waste, CO2 emission and global warming

b/ Photovoltaic: they bring clean energy and reduce dirty energy consumption that are part of global warming (petrol, coal, ...)

Since Tunis is an African place, close to Europe, ESPRIT also proposes to host a meeting of a future Scientific Committee CESAME, in order to prepare phase 2.

3. Third CESAME session: Western Cape Area, South Africa, in the Cape Teaching and Leadership Institute (CTLI)

It will be held no later than September 2019, and hosted in the very Western Cape Education Department (WCED).

Title: Inquiry Based Science and Mathematics Education (IBSME) using computers

Coordinator: Professor Barrie Barnard

In Western Cape, a consortium of five groups involved in the sciences and mathematics has been brought together from institutions working on school outreach to assist school teachers: three local universities and two NGO's plus WCED. The steering committee has found that, at least at the primary level, it is opportune to introduce IBSE in more than one subject, namely science and mathematics at the same time. Emphasis is put on the added use of computational methods and technology.

A pre-CESAME one-day event is planned on IBSME on March 27-28, 2019 with at least 25 people for science and 25 people for mathematics. The objective is to get clarity on the methodologies and approaches used in the five groups.

This third CESAME session is built up in close partnership with the WCED. Subject advisors and lead teachers will be trained in IBSME to introduce them to this approach. By the end of October 2018 WCED will build in inquiry-based training sessions in their 2019 school programme, which will simplify implementation of the CESAME project in the Western Cape classrooms. A specific two-days conference on March 27-28 will accurately define the programme of the CESAME session

Phase 2 of CESAME: two more years

This phase should prove validity of the CESAME concept in at least two or three countries by launching solid pilot projects approved and supported by the local Departments of Education with clear impact in the classrooms and training of a significant number of teacher educators (or teachers).

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