



**Report of CCE project 'Research-based evaluation of the Young Ambassadors for Chemistry project':**  
**www.iupac.org/web/ins/2007-005-2-050**

**Lida Schoen, Mei-Hung Chiu and Erica Steenberg**

YAC	Date	Host	Project team	Local organiser(s)	Public venue for YAC event	Publicity
Taipei, Taiwan	August 12, 2010	ICCE 21, chair Mei-Hung Chiu (TM CCE)	Erica Steenberg (evaluator), Lida Schoen (organiser)	Dr. Shiao-Lan Chung	in front of City Hall at the foot of Taipei 101	<a href="https://picasaweb.google.com/115064382073022993925/ICCE0812Afternoon">https://picasaweb.google.com/115064382073022993925/ICCE0812Afternoon</a>
Ethiopia, Addis Ababa	February 18-19, 2011	Temechegn Engida, president FASC	Mei-Hung Chiu (evaluator), Lida Schoen (organiser)	Dereje Kidane Mariam, Getachew Atnafu	in front of Ministry of Education	Ethiopian News Agency, video

### Taipei, Taiwan, August 12, 2010

Prof. Mei-Hung Chiu (Chairman Organizing Committee of the conference, National Taiwan Normal University) took the initiative for the YAC workshop. Dr. Shiao-Lan Chung organised the course in the Taipei International Convention Center (TICC) and the event outside in front of the City Hall at the bottom of Taipei 101 (with 101 floors and 509 m the second highest building in the world!). 14 teacher participants and 30 students from Shiao-Lan's school, participate in the YAC programme.

Mei-Hung asks 3 volunteers as external evaluators of the YAC activities: Prof. Fortunato Sevilla III (Philippines), Dr. David Katz (USA) with Dr. Eva Åkesson (officer CCE, Sweden) as chair. All agree to act as jury as well.



*Teacher participants with course leaders and jury in TICC*

We end the 2h instruction and training session in the Convention Hall (TICC) with preparing the YAC event, by appointing coordinators for chemicals, packaging (nice little jars), stationery and the roving reporters.

Under a black sky teachers and participating students walk to the public venue in front of the city hall at the foot of Taipei 101, the one but tallest building in the world (509 m)! It was raining just before we leave TICC, so we are very lucky! A presentation platform with a huge YAC banner at the back, covering tents with a table and stools for the students and a complete disc jockey station are waiting for us!

The students receive a YAC bag with YAC badge and a set of instructions for the competition and the practical work. Although the sky occasionally becomes very dark, new rain stays away! The students work in groups at different 'stations'.



*Taipei 101 (101 floors, 509 m)*



*Venue for the YAC event*



*Lots of work to do for the students, members of the jury observing*



*Student helps a visiting young boy with the practical work*

We receive many parents with very young kids. With help of our students they manage with the hands on experiments and they are allowed to take their products home.

As soon as the students feel comfortable, half of each group, our roving reporters, start interviewing the public about their ideas on chemistry before and after showing the activities (see 'Evaluation'). We could have welcomed more visitors in better weather conditions.

Choosing the best team is a difficult job. Mei-Hung invites 3 winning teams to show their presentations during the participants night later that evening. These teams are honoured in front of all students and the public with small prizes. Before we return to TICC all students receive a certificate of recognition for being **great Young Ambassadors for Chemistry!**

The participants night starts with the presentations of the 3 winning students' groups with Prof. Morton Hoffman interviewing the students in his inimitable way.



*All student winners with organisers and jury*



*Exciting presentation*



*Mei-Hung closes the event*

**Websites:** <http://www.xs4all.nl/~amschoen/YACTaiwan>;  
<https://picasaweb.google.com/115064382073022993925/ICCE0812Afternoon>

## **Addis Ababa, Ethiopia, February 18-19, 2011**

Prof. Temechegn Engida (President FASC) took the initiative for the workshop. The University of Addis Ababa hosts YAC Ethiopia, being the **first YAC** to be organised in **IYC 2011**. The course is organised in the Chemistry Department, the YAC event in front of the Ministry of Education, a spatial location in a pedestrian area with lots of public around.

41 Teachers from all over Ethiopia and 40 students from 6 secondary schools in and around Addis Ababa, participate in the programme.

During the 1½ day course we start discussing possibilities for students taking part in global projects by using global exchange programmes using social media. The showed examples generate many good ideas. We use the 2<sup>nd</sup> morning to prepare the YAC event. We divide roles and appoint coordinators: for taking care of the chemicals and the stationary and guiding the roving reporters.







All participants and organisers after the opening ceremony

We are very audible (microphones and loudspeakers) and visible for the public on this busy roundabout! The start is quite chaotic with straightaway lots of very interested visitors. Student **Mebratu Merga** often holds the microphone and speaks to the audience in Amharic. Different teachers and students follow. The roving reporters do a wonderful job. Visitors that answer the questions receive a YAC sticker. Our coordinator manages to collect 87 questionnaires.

The students prepare their presentations, unluckily just before the start



Start of the YAC event

of the presentations, we encounter a power cut, so no more microphones! But the students cope with student 'leader' **Mebratu** moderating! They climb on a table, so everybody can see and hear what and how they are presenting chemistry: a lot of creativity with nice posters, singing raps, shouting and dancing! The jury (**Dr. Sileshi Yitbarek** - Kotebe College of Teacher Education, KCTE, **Dr. Messay Mulugeta** - Addis Ababa University, chemistry staff, **Dr. Shimelis Admasie** - Head of Chemistry Department AAU and **Mr. Nega Gichile** - MOE-Chemistry Curriculum expert, appoints 3 winning groups.



Roving reporters question the passing public about their ideas about chemistry



Great presentations without a microphone!



Mebratu announces the winning group of Akaki Adventist School

This was the glorious end of our 12<sup>th</sup> YAC event, the 1<sup>st</sup> in Ethiopia and the 1<sup>st</sup> during this UNESCO / United Nations International Year of Chemistry!.

## Publicity



የኢትዮጵያ ዜና አገልግሎት  
The Ethiopian News Agency

የመጀመሪያዎ የኬሚስትሪ ዓመት ተሸላሚ 100ኛ ዓመት በኢትዮጵያ ይክበራል

The centenary of the first female Nobel prize winner will be celebrated in Ethiopia

ባለፈው ቅዳሜ የዓለም አቀፍ የኬሚስትሪ ዓመት ክብር በዓል የተለያዩ የኬሚስትሪ ትውግዎች ላይ ተማሪዎችና አስተማሪዎች በአደበባይ ለሕዝብ ባላዩበት ስነ ስርዓት መጀመሩን አስታውቀዋል።

The International Year of Chemistry began its celebration in an open square last Saturday by a show, demonstrated to the public by students and teachers

Website: <http://www.xs4all.nl/~amschoen/YACEthiopia>

## Evaluations of YAC (Ethiopia)

As the results of the short YAC Taiwan and (the much longer) YAC Ethiopia show mainly similarities, we choose to discuss the Ethiopia evaluations in more detail.

Responses of the questionnaires designed for students, teachers and public show representative data from our target participants.

### Students (N=26)

(1) Data analysis revealed high satisfaction of the YAC activity was observed from the students (Table 1).

**Table 1. Students' responses to perceptions of the YAC activities**

	Average Score
(1) After this activity, I acquire more about the application of chemistry in our daily life.	4.77
(2) I am satisfied with the content of teaching materials of this activity.	4.46
(3) I am earnest to participant in this activity.	4.58
(4) I think I learn much from this activity.	4.77
(5) I think this activity is valuable, and it should be held more often.	4.68
(6) I did not know that chemistry is related to our daily life.	1.8
(7) Before this activity, my image of chemistry is positive.	4.31
(8) After the activity, my image of chemistry is positive.	4.88

Note: The highest score is 5 points.

(2) The order of students' preference on chemistry (from the most to the least)

1<sup>st</sup>



2<sup>nd</sup>



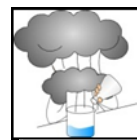
3<sup>rd</sup>



4<sup>th</sup>



5<sup>th</sup>



## 2. Teachers (N=23)

(1) For the teachers, the data analysis revealed a similar trend of teachers' satisfaction of the YAC activities as observed from students (Table 2).

**Table 2. Teachers' responses to perceptions of the YAC activities**

	Average Score
(1) After this activity, I acquire more knowledge about application of chemistry in our daily life.	4.77
(2) I am satisfied with the content of teaching materials of this activity.	4.82
(3) I am earnest to participant in this activity.	4.6
(4) I think I learn much from this activity.	4.81
(5) I think this activity is valuable and it should be held more often.	4.74
(6) I think it is important for students to learn chemistry via its applications in our daily life.	4.95
(7) I think it's meaningful to encourage students to communicate with foreign students by using internet resources.	4.95

(2) The order of teachers' preference on chemistry (from the most to the least) reveals exactly the same as the students'.

1<sup>st</sup>

No.2

2<sup>nd</sup>

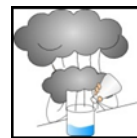
No.3

3<sup>rd</sup>

No.1

4<sup>th</sup>

No.4

5<sup>th</sup>

No.5

(3) Most problematic issue were the computer facilities arranged for lecturers and teachers. Often the internet connection didn't function well (enough).

		Average Score
(1)	The instructors were very devoted to their teaching.	5
(2)	The instructors provided innovative resources for improving chemistry teaching.	5
(3)	The program was designed very smoothly.	4.5
(4)	The program covered a wide range of activities (use computers, hands-on) that link with its goal tightly.	4.5
(5)	The materials used in the workshop are very appealing.	4.5
(6)	The materials used in the workshop are adaptable for promoting public understanding.	3.5
(7)	Teachers are actively involved in the activities and enthusiastic to learn about YAC.	4
(8)	Teachers are willing to learn about the internet for teaching chemistry.	4
(9)	I consider this YAC workshop to be a sustainable project in the future.	5
(10)	I value this workshop highly, and recommend to be held more often.	5
(11)	Teachers attend the workshop on time.	4
(12)	Teachers appear to the workshop all the time.	4.5
(13)	The location for conducting the YAC workshop is good.	4
(14)	The facility in the classroom was good.	4
(15)	The computer room has good equipment for the workshop.	2.5
(16)	The time schedule for the YAC program is controlled well.	4
(17)	The YAC program teaches teachers chemistry concepts.	4.5
(18)	The YAC program teaches teachers skills in doing chemical experiments.	4.5

### 3. Public (N=87)

We found that it was quite difficult to get the public involved in interviews (Table 3). Visitors (especially kids) were more interested in carrying out the practical activities! Meanwhile, this shows a need for preparation of the outside event should be planned 'better' in advance.

**Table 3. Responses to the questionnaire from the public**

		Average Score
(1)	The public is very devoted to the activity that students are working on.	5
(2)	The public is very difficult to get interviewed.	3.5
(3)	The setting for YAC event is satisfied.	5
(4)	The YAC event attracts a lot of public to participate.	5

As for preferences, there is a slight difference between the public, students and teachers (see below). It suggests that all participants tend not to consider the explosion reminding them chemistry the most. On the contrary, carrying out experiments is considered more representative than the other options!

1<sup>st</sup>2<sup>nd</sup>3<sup>rd</sup>4<sup>th</sup>5<sup>th</sup>

#### 4. External evaluators

The evaluators expressed that the students really liked to perform, like actors on the stage, in particular, in front of a TV camera. Very nice, excellent! They also commented that the ceremony was very interesting, but limited to Addis. It would be excellent to stretch to rural areas.

#### 5. Local organisers in Taiwan and Ethiopia

##### **Taiwan**

Perfectly organised by an experienced teacher / staff member of **National Taiwan Normal University**. Just before the event it was pouring with rain, it stopped in time! We could have welcomed more visitors in better weather conditions.

##### **Ethiopia**

Difficult organisation because of

- no good overall idea what it was going to be (despite many provided documents and pictures);
- not a lot of experience with organising practical work;
- hardly access to suppliers for 'school' chemicals.

#### **Spin-off: small YAC activities in Kuwait and Jordan during IYC 2011**

YAC activity	Date	Host	Local organiser	'Public' venue for YAC event	Contact after activities
Kuwait City, Kuwait	April 18, 2011, during 2 <sup>nd</sup> Kuwait ChemTea Network Conference (April 17-18)	Dr. Abdul Aziz Al-Najjar, president of Kuwait Chemical Society	Dr. Mervat with assistant Achmed	Science Centre Kuwait City	Dr. Abdul Aziz Al-Najjar
Irbid, Jordan	April 20, 2011, during Sixth Jordanian International Conference on Chemistry (April 19-21)	Prof. Sultan Al-Orabi, President of Yarmouk University, Irbid	Prof. Ayman Hammoudeh with many assistants (PhD students)	Chemistry Department of Yarmouk University	Prof. Ayman Hammoudeh (vice dean of Faculty)

#### **Kuwait**

Dr. Abdul Aziz Al-Najjar invited Lida (together with Prof. Roy Tasker (University of Western Sydney, Australia) and Dr. Al Hazari (University of Tennessee, USA) for a plenary and workshop (after all 3 practical workshops were organised) during the 2<sup>nd</sup> Kuwait ChemTea Network Conference for secondary and tertiary teachers (April 17-18).

In the presence of the Minister of Education Mrs. Nouria Subeith Barrak Al-Subeith the conference opens in the IMAX theatre with around 100 participants. After the plenaries of Roy Tasker (Australia: results of educational research) and Al Hazari (USA: inimitable science demonstration). I present my 'lecture' (Cosmetics as a context for teaching and learning) in a (relatively small) room to (too many) interested participants, that ask many questions. Immediately after, 30 girls and their teachers are waiting for practical work in the lab. In 30 minutes most of the girls manage to produce an emulsion, while the next group with another 30 girls is waiting on the doorstep to produce a hair gel and/or a shampoo. Enthusiastic girls (and their teachers) leave with many thank



you's.

During the afternoon most participants (mainly female) join for the practical work and preparations. It is clear they 'never' present 'our' way about practical work, one group reflects completely differently on the activity (very useful!).



*Practical work in the Science Center*



*Second students' group*



*Teacher participants with an assistant from the Science Centre*

After this 'hard work' I get a henna treatment to experience the relationship chemistry-culture in Kuwait!

## Jordan

Prof. Sultan Al-Orabi, President of Yarmouk University in Irbid invited many speakers from abroad (e.g. IUPAC President Nicole Moreau) for the Sixth Jordanian International Conference on Chemistry.

I present the YAC project to a selected group participants and (PhD) students in an (over)crowded room. Communication could have been better with an interpreter. For the practical work 19 more students from the secondary (University) school with their teachers Khansa and Jameela Abu Naser join us in the new (also overcrowded) basement 'lab'. The start is slightly chaotic, but with many assistants (Tala Alqor'an, Anas Aladeli and Ammar Talafha in a double role, also as photographer and filmer), we cope. With great results: mostly creative presentations in Arabic with all others yelling and singing, a lot of involvement and a real competition: who sells chemistry the best!



*Practical work in our improvised lab*



*All students together*



*Original attempt to 'sell' chemistry*

## Publicity

- Pictures Kuwait: <https://picasaweb.google.com/MvEnkhuizen/Kuwait2011>;
- Pictures Jordan: <https://picasaweb.google.com/MvEnkhuizen/IrbidJordanApril2011>.

## Reflections after spin-offs

Fruitful discussions during and after the activities with the organisers lead to probably more and other (practical) activities in the (near) future following a 'list' of recommendations, we agreed on.

## Acknowledgements

### Taiwan

- ICCE 21, chair Mei-Hung Chiu for taking the initiative and facilitating the course and event in Taipei;
- Dr. Shiao-Lan Chung with her team for perfect organisation;
- Jury Prof. Fortunato Sevilla III (Philippines), Dr. David Katz (USA) and Dr. Eva Åkesson (chair, Sweden);

- **Prof. Morton Hoffman** (USA) for help and interviewing many students;
- **CCE** for facilitating travel and subsistence expenses for Erica Steenberg and Lida Schoen.

### ***Ethiopia***

- **Dr. Temechegn Engida** for taking the initiative for organising the YAC course and event in Addis Ababa;
- Dereje Mariam Kidane and Getachew Atnafu for local organisation;
- **Dr. Sileshi Yitbarek** (Kotebe College of Teacher Education, KCTE), **Dr. Messay Mulugeta** (Addis Ababa University, chemistry staff), **Dr. Shimelis Admasie** (Head of Chemistry Department AAU) and **Mr. Nega Gichile** (MOE-Chemistry Curriculum expert);
- **Ministry of Education** (MOE) for providing the public venue in front of the building;
- **IUPAC** for facilitating travel and subsistence expenses for Mei-Hung Chiu and Lida Schoen;
- **UNESCO** for facilitating different local costs;
- **Addis Ababa University (AAU)** for providing venue, computer facilities and assistance;
- **Bio-Rad USA** for donating the 'Genes in a bottle' classroom kit';
- **National Taiwan Normal University** for donating educational stationeries, bags and many other goodies as prizes;
- **IFF** (International Flavors & Fragrances Inc.) for donating the ingredients for the perfume;
- **Roche Switzerland** for donating educational cd-roms: Roche Genetics.

### ***Kuwait***

- **Dr. Abdul Aziz Al-Najjar** (President of the Kuwait Chemical Society);
- **Kuwait Chemical Society** for facilitating travel and other costs to and in Kuwait;
- **Science Centre staff (Amna)** for helping with local organisation.

### ***Jordan***

- **Prof. Sultan Al-Orabi**, (President of Yarmouk University, Irbid) for the invitation;
- **Yarmouk University** for facilitating my stay in Irbid;
- **Prof. Ayman Hammoudeh** (Vice Dean of Chemistry Faculty), PhD or graduated students **Tala Alqor'an**, **Anas Aladeli** and **Ammar Talafha** for helping with local organisation.

### ***For all YACs***

- **SASOL Germany** for donating the detergent;
- **Seppic France** for donating the emulsifier for the emulsion.

### ***Spin-offs in countries we visited (as far as we know)***

- **YAC Taiwan** was the 4<sup>th</sup> YAC activity after starting in 2004, apart from many smaller activities without our presence;
- **YAC Cyprus** was repeated 2x in Limassol and Paphos after starting in 2009 (initiated by Inspection and with help of Chemistry Teachers Association);
- Smaller activities like taking part in Science Festivals (we know about) in **Bulgaria** (nearly every year), **Mauritius** after starting in 2008, **Ethiopia** (Sileshi Yitbarek) after starting in 2011.

### ***Possible new YAC visits***

- **YAC Puerto Rico** (before IUPAC General Assembly, July 29, 2011);
- **YAC Tanzania** (2012 after failing in 2011);
- **YAC South Africa** (2012 after failing in 2011);
- **YAC Mexico – Panama** (2012).