

# Young Ambassadors for Chemistry in Kuching, Sarawak, Borneo, Malaysia

Monday-Tuesday, August 15-16, 2016

The course for the global project Young Ambassadors for Chemistry of the Committee on Chemistry Education (CCE) of the International Union of Pure and Applied Chemistry (IUPAC) was successfully held in Kuching, Sarawak, Borneo, Malaysia on August 15-16, 2016. This project aims offering new content and new ways to teach chemistry and to enable young students to communicate about applied chemistry with a general public.



All VIPs, organisers, trainers and teacher participants after the opening ceremony

The International Conference on Chemistry Education (ICCE 2016) in Kuching from August 15-20, 2016, hosted and facilitated the YAC course, with support by the CCE (project 2015-058-2-050: 'Young Ambassadors for Chemistry (YAC), related to the UN Sustainable Development Goals'. The YAC training course for teachers was hosted by SMK Sakura and the public YAC event with the students took place in the Borneo

Convention Centre Kuching, the venue of ICCE 2016.

40 Teachers (20 Chemistry and 20 English teachers) from Sarawak and 60 students with 20 accompanying teachers from different secondary schools, participated in the programme.

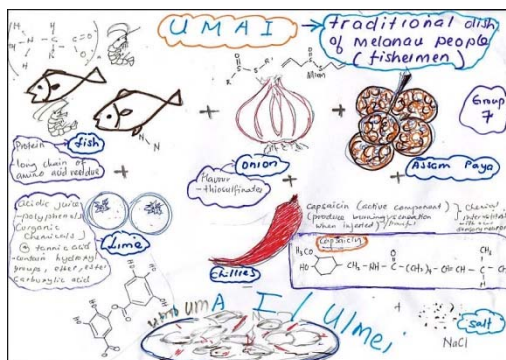
## Monday August 15, 2016: Daily life chemistry



Opening ceremony at prime time in the evening on Sarawak TV1 with, left to right: Prof Mei-Hung Chiu, Dr Lida Schoen, Dato' Dr Ong Eng Long, YB Fazzrudin bin Hj Abd Rahman, Mr Abang Mat Ali bin Abang Masagus and is Dr. Norisah Bt Haji Suhaili

After the official opening in SMK Sakura in presence of a photographer and Sarawak TV1 with IKM president Dato' Dr Ong Eng Long, YB Fazzrudin bin Hj Abd Rahman (Member of State Assembly for Tupong), Mr Abang Mat Ali bin Abang Masagus (Deputy Director of Education Department Sarawak) and Dr. Norisah Bt Haji Suhaili (headmistress SMK Sakura)

the official group photo is taken. All VIPs leave and we are invited to enjoy drinks and bites to eat in the school's canteen. After a short introduction about the aims and history of the YAC programme the participants start to generate ideas for the chemistry of a product or phenomenon in Sarawak, that is interesting to exchange with students abroad. We all learn about the (bio)chemistry of many local products and a way to find



Chemistry and use of many local products

exchange partners all over the world ([Factworld](#), [Edmodo](#), [Trashed World](#)). We discuss the value of these activities and visualise the outcomes with keywords on post-its.



*Post-it session led by Mr Enid Ak Dundang from SMK Paku, Bau*



*Demonstration practical work*

Mei-Hung shows a newly developed app of augmented reality to produce 3D images of different functional groups of chemical compounds, such as alcohols and acid, etc. in Taiwan. The teachers showed their interest in using their smart phones to visualize the chemical structures of organic compounds. However, due to half of the teachers were English majors, so not all teachers were beneficial from the use of the innovative technology.



*Augmented reality activities*

Lida goes on with a demonstration of the practical work. Tomorrow participating students have to be the designers and producers of a new innovative sustainable Malaysian cosmetic line from preferably only local ingredients. A teacher participant acts as a valuable assistant. A PowerPoint presentation with scientific background information and all other resources are available for the participants.

Senorita Anak Masek of the Ministry of Education attended the whole first day of our course. During the whole course and event Ong Kok Tong and Teo Kien Yung, our 2 student assistants (UNIMAS) help us as chemists, sound experts, technicians, photographers and Jacks of all trades!

### ***Tuesday August 16, 2016: YAC preparation for the event with the students***



*Good looking products*

In groups of 4 the participants design their cosmetic line and carry out the experiments. They prepare and show great presentations marketing their products in a 30 seconds TV spot. As an extra we get 2 experienced YAC teachers from Taiwan to help.

The winning groups receive little prizes from the Netherlands. The English teachers helped with their knowledge of marketing language! All teachers showed a very good

example of 2 disciplines collaborating in one project: chemistry teachers as the content experts, English teachers a communication experts.





*Producing the new cosmetic line*

*Best actress Mdm Josephine Muna Ak Banggan from SMK Seri Setia*

*Winning teachers group*

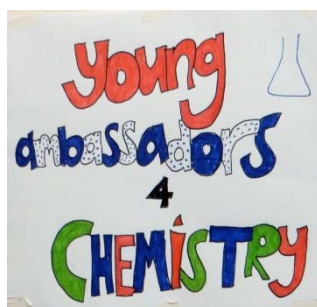
Our last job is to divide roles, so we can guide 60 students with 20 new accompanying teachers, that will arrive in BCCK in the afternoon. We appoint coordinators for dividing the students in groups of 4, handing them their instructions and stick a number on their table, for dispensing the chemicals, packaging and stationary. To finish the YAC course all teachers receive a certificate with the signature of Natalia Tarasova, IUPACs President.

### ***Tuesday August 16, 2016: YAC event in BCCK***

In no time the teachers manage to organise the newly arrived students and their accompanying teachers and the practical work starts. All students and the new teachers on their own tables



*Teacher instructs the just arrived students.*



*Teachers quickly prepare YAC poster to decorate the venue.*



*Students start with the practical work.*



*Visiting mother and daughter get instructions from a student.*



*Marketing poster*



*Students prepare their presentations.*



*Our distinguished international jury: left to right Prof Uday Maitra (India), Dr. Sieng Huy (Cambodia) and Prof Mustafa Sozibilir (Turkey)*



*Students present their 30 second TV spot.*



*Winning group with the jury and Mei-Hung Chiu and Lida Schoen*

easily find their way to needed chemicals, packaging and stationary. After finishing producing

their cosmetic line, consisting of bath salts, hair gel, shampoo and cream/lotion they decorate their little jars and bottles. They also prepare their presentation with the available stationary and their texts with help of the English teachers. We notice a lot of creativity, combining chemistry with art work and text.

Our distinguished international jury with Dr. Sieng Huy (Cambodia), Prof Uday Maitra (India), and Prof Mustafa Sozbilir (CCE chair from Turkey) has the difficult job to appoint winning



*Dr Sim receives her present, left to right Prof Uday Maitra, Dr. Sieng Huy, Prof Mustafa Sozbilir, Lida Schoen, Dr Sim Siong Fong, Datuk Dr Soon Ting Kueh, Mei Hung Chiu*

teams between 12 good presentations, showing a lot of creativity. But the total score after marking on 4 items: outlook and quality of the individual products, cohesion in the line, quality and originality of the labels and originality of TV commercial, showed the winners. Dr Sieng announced the result and the winners got little presents from Taiwan and the Netherlands and a photo shoot with the jury and the trainers.

Many thank you's follow, starting with Dr Sim, that organised YAC locally so well. Next thank you's for the students, the teachers and all organisers by Prof Uday (jury), Prof Sozbilir (chair CCE) and Datuk Dr Soon (chair ICCE

2016), the glorious end of our 15<sup>th</sup> official YAC event, with students being great **Young Ambassadors for Chemistry!**

## Evaluation

**Questionnaires** for YAC teachers, students and public  
Numbers collected: teachers:42, students: 51, general public:41

### **Comparison between teachers and students**

On the content of the activity, most of the teachers (strongly agree 19%; agree 71%) and students (strongly agree 55%; agree 41%) agree that they have understood more about the application of chemistry in their daily lives through this activity. Most of the teachers (strongly agree 29%; agree 64%) and students (strongly agree 55%; agree 37%) also found the content of the activity material to be satisfactory. A majority of teachers (strongly agree 17%; agree 74%) and students (strongly agree 55%; agree 39%) stated that they were earnest in their participation in the activity. While most teachers (strongly agree 14%; agree 62%) and students (strongly agree 39%; agree 47%) also believed that they have learned much about the development of contextualized materials for chemistry lessons from this activity, a minority (teachers 19%; students 8%) had "no opinion" on the issue. Therefore, it is clear that a majority of teachers and students were able to acquire new knowledge on chemistry from this activity.

Most of the teachers (strongly agree 50%; agree 48%) and students (strongly agree 53%; agree 37%) believed that there is value in doing this kind of hands-on activities, and more of these activities should be held. Yet, there is still a minority of students (strongly agree 53%; agree 37%; no opinion 8%) who did not have any opinion. This means that hands-on activities were not able to make these students interested in the topic.

Before the activities, most teachers (strongly agree + agree = 79%) and students (strongly agree + agree = 86%) had positive views on chemistry; 17% of the teachers and 10% of the students had no opinion towards chemistry. However, after the activities, the percentages of teachers and students who had no opinion on chemistry both decreased to 2%. The percentages for those teachers and students who had positive views on chemistry increased to 98% and 94% respectively, indicating the activities were able to influence both teachers and students.

## **Teachers**

86% of the teachers interviewed, stated that their schools have provided tablets for them to use in their classes; however, only about 10% of the teachers would actually make use of these tablets.

Most teachers (67%) liked the augmented reality activities and would like to participate in similar activities in the future. Teachers (57%) were also willing to incorporate augmented reality into their instruction and use it with their students. Nevertheless, there were still some teachers who did not have an opinion on these issues (26%; 31% respectively). Maybe these teachers are not interested in augmented reality. Some teachers (strongly agree 14%; agree 31%) also believe that the inaccessibility of chemicals would prevent them from conducting these activities/experiments with their students. Only a minority of teachers (disagree 24%) believed that access to chemicals would not be a problem.

## **Students**

Most of the students (90%) use smartphones and all students (100%) said that they enjoy using smartphones to learn. 75% of the students said that they were willing to share these activities with classmates; 10% of the students had no opinion.

## **General Public**

Due to the constraint of the location of the conference venue, we were not able to bring the 'general' public to the conference venue, as it was far away from the city area. However, many conference participants and partners with even young children joined the activities, working with the local school students and teachers on the cosmetics activities. They could make their own lotions and hair gels, showing their high interest in the activities.

In the survey, this public had an overall positive impression of chemistry (98%); they also believe that chemistry plays an important role in our daily lives (100%). About 90% of the public is aware that cosmetics contain chemicals. However, regarding how much they really understand chemistry, 32% of the public believe that they know a lot, 51% said they have an ok knowledge of chemistry and 15% believed they only know a little.

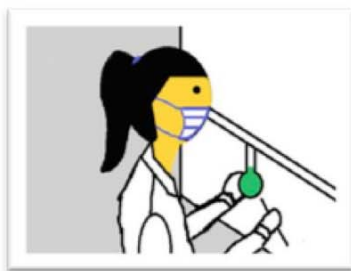
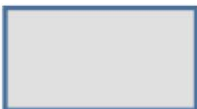
After seeing the students participating in the activities, most of the public (88%) said they liked the activities, and also believed that these activities are helpful for students learning chemistry. Regarding what can help them learn chemistry, the current workshop has received the highest number of votes (61% of the general public), followed by the Internet (56%). Learning from their own kids and radio received the least number of votes (2% and 12% respectively). Newspapers and social media received 27% each, indicating that it is more difficult for the general public to receive information on chemistry through these two mediums.

Regarding the five pictures underneath, teachers and the public had similar thoughts: most of the teachers (57%) and the public (34%) believe Figure 3 is the most suitable representation for chemistry, followed by Figure 2 (teachers 48%; public 22%), Figure 1 and Figure 4. Figure 5 is seen as the least suitable representation for chemistry (teachers 50%; public 41%). Students see Figure 5 and 3 as the most suitable representations for chemistry (35% and 33% respectively). The least suitable Figure in students' opinion is Figure 4 (50%). Consequently, there is a consensus regarding Figure 4 as the least suitable representation. However, there is also a clear difference how students and the teachers/public see chemistry. As students consider Figure 5 as a suitable representation of chemistry, it is possible that they selected this figure to be playful or that they believed chemistry can be somewhat dangerous, so could lead to unexpected results.

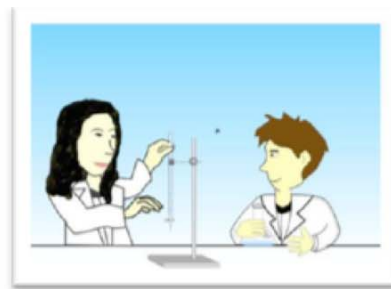
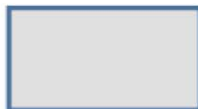




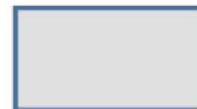
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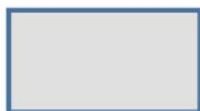
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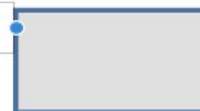
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### **Acknowledgments**

- CCE, IUPAC for facilitating travel expenses for Lida Schoen;
- Datuk Dr Soon Ting Kueh (IKM) for inviting and facilitating the YAC team to be part of ICCE 2016 in Kuching;
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- Ong Kok Tong and Teo Kien Yung for being great assistants during the whole YAC course and event;
- Dr Shiao-Lan Chung and Ming-Chuan Chang for assisting during the practical work;
- Dr. Norisah Bt Haji Suhaili (headmistress SMK Sakura) for hosting us in SMK Sakura;
- Barentz Pharma & Cosmetics, the Netherlands for donating the Chinese emulsifier Tinci (Guangzhou Tinci Materials Technology Co., Ltd.: [www.tinci.com](http://www.tinci.com)) and the Brazilian emulsifier Emulfeel (Chemyunion: [www.chemyunion.com.br/en/](http://www.chemyunion.com.br/en/));
- Sasol Germany for donating the detergent for the shampoo ([www.sasolgermany.de](http://www.sasolgermany.de));
- Florale Haircare Group for donating professional 'cream' jars ([www.floralehaircare.com](http://www.floralehaircare.com));
- Merck Chemicals Benelux for donating pearl pigments ([www.merck-performance-materials.com/en/cosmetics/cosmetics.html](http://www.merck-performance-materials.com/en/cosmetics/cosmetics.html)).

**Text and pictures: Lida Schoen and Mei-Hung Chiu  
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