Young Ambassadors for Chemistry (YAC) in Thailand

All participants in the National Science Museum behind the YAC poster

The course for the global project Young Ambassadors for Chemistry was successfully held in Bangkok, Thailand from November 25-26, 2014.

The initiative to host YAC in Thailand was expressed by Datuk Dr. Ting-Kueh Soon, National Representative of Malaysia in IUPAC's Committee on Chemistry Education (CCE) and former president of the Federation of Asian Chemical Societies. Before Dr. Soon took the initiative to host a YAC course and event in Ipoh, Malaysia in 2010.

YAC Thailand was organised by Prof. Supawan Tantayanon, Immediate Past President of the Federation of Asian Chemical Societies, in co-operation with the Chemical Society of Thailand (CST), the Department of Chemistry, Chulalongkorn University, the National Science Museum (NSM) and Dow Chemical Thailand Co., Ltd..

Prof. Supawan and a small group of PhD students prepared the YAC course in the National Science Museum and the event in the Chamchuri Square Shopping Mall. 40 teachers and 70 students from secondary schools from in and around Bangkok, participated in the YAC programme.

Prof. Supawan Tantayanon opens the YAC course in the National Science Museum.

YAC course: Tuesday November 25, 2014

Lida Schoen (Netherlands, course leader) and **Mei-Hung Chiu** (Taiwan, Chair CCE, evaluator) are welcomed in Bangkok by a group of Supawan's PhD students (Ong-art Thanetnit, Maslin Chotirach, Sarocha Sumrunrownasak and Bhasit Hongthong), that already prepared all practical work for the participating teachers and students.

Preparing the practical work with (left to right) Lida, Mei-Hung, Bhasit, Maslin and Ong-art before the start

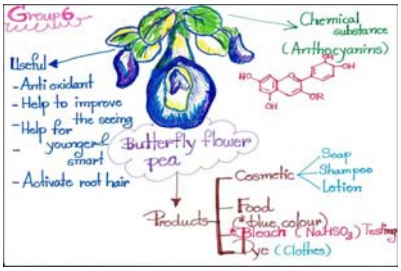
Prof. Surin Laosooksathit officially opens YAC Thailand

Opening ceremony with (left to right) Mei-Hung, Lida, Poranee Kongamornpinyo, Prof. Tantayanon and Prof. Varawut Tangpasuthadol

40 Participants signed up for the course. After the official opening ceremony with Prof. Surin Laosooksathit (President of the Chemical Society of Thailand), Prof. Supawan Tantayanon (Chulalongkorn University), Poranee Kongamornpinyo (Director Public Affairs Dow Chemical Thailand), Prof. Varawut Tangpasuthadol (Department of Chemistry, Chulalongkorn University), Mei-Hung and Lida, a group photo of all organisers, trainers and participants is taken.

Lida and Mei-Hung familiarise the teachers with the YAC project (of the International Union of Pure and Applied Chemistry: **IUPAC**). After our first break with great Thai food, we ask the teachers to visualise the chemistry of a local product. Soon smart phones appear for researching the composition and production of the chosen daily products.

Group work on the chemistry of daily life products in Thailand (1)



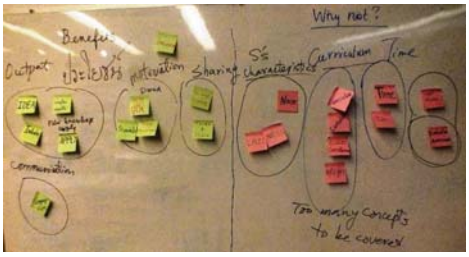
Example of chemistry and applications of the pea of the butterfly flower

This first group work ends with good presentations about 9 different products, some in Thai, others in English. Communication hadn't been possible without the help of Prof. Boonnak Sukhummek of King Mongkut's University of Technology Thonburi (KMUTT) and the CST, as the liaison between the teachers' Thai and our English.

After lunch we go on with a structured group discussion about the benefits of the context approach of teaching chemistry for students (and teachers!). We agree on 3 main benefits: application of new knowledge, communication about chemistry and motivation. As we were told teachers don't use contexts from daily life in this way, the internet as a source of new knowledge, discussions in a group (of 4) and arguing on the 4 most important issues, we start a new discussion: 'Why not?' The overall conclusion is that teachers have to cover too many concepts in too little time, are afraid of 'noise' in the classroom and sometimes colleagues are suspected to be too 'lazy' to change.

Group work on the chemistry of daily life products in Thailand (2)

Prof. Boonnak Sukhummek helps out with the language.



Result of the group discussions about teaching the chemistry of daily life products: benefits for students and why it can't be done in practise.

We end the day with a hands-on demonstration of the practical work on producing cosmetics: theory about raw materials, where to apply it within the curriculum, procedures and pitfalls. We are ready for preparing the YAC event tomorrow afternoon!

YAC course: Wednesday November 25-26, 2014

Teachers prepare their innovative Thai cosmetic line and their marketing campaign.

Example of a new Thai cosmetic line: bath salts, shampoo, hair gel and a cream

Quality control of this very special new Thai cream

The following Wednesday we start with the practical work. Ong-art, Sarocha and Maslin perfectly prepared everything (chemicals, jars, stationary) in advance and the teachers do very well along their instructions in Thai.

They act as ***designers, producers and marketing experts*** for a new Thai cosmetic line. In around 90 minutes they produce and advertise 9 different cosmetic lines in a 30 seconds television commercial with many creative ideas and great acting! Our jury (Supawan, Boonnak and Nantida Sripaorapa of the NSM) have the difficult job to choose a winning group and a best actor. The jury decides to ask the 2 best actors (Pornsawan Krajangsod and Nichapa Donkunha) to communicate with the public, the students and the officials during the coming event!

Winning group of teachers after presenting their new Thai cosmetic line

Augmented reality (AR)

Next Mei-Hung updates the participants with possibilities of Augmented Reality (AR). While the number of smartphones and tablets dramatically increases across the world, the school science curriculum should embrace this new innovative technology for scaffolding students' learning of complicated chemistry concepts that need to link different modes (e.g. macro, micro and symbolic representations) of chemical knowledge. Moreover, in order to better

understanding chemistry concepts, students need to link among different representations and be able to visualize the spatial relationship of chemical compounds. So, Mei-Hung introduces how to use mobile technology in high school chemistry classes, specifically, the integration of smartphone and augmented reality (AR) in the learning polarity between 2 compounds, structure of a carbon nanotube and the structure of water with H-bonds. The participants are enthusiastic to use the app and to learn about the benefit of the use of technology.

Last preparations

We end the morning with dividing roles for the teachers and soon we can write down volunteer coordinators for chemicals, packaging, stationary, forming groups of 4 of the arriving students, for instructing the roving student reporters and teachers to help the students with their marketing 'language'. Before lunch we end with reflecting on the expectations of the participants, they wrote down at the start of the course. Last, but not least, we thank everybody, involved in the preparation and organisation of this successful course. All teachers receive a certificate of attendance with the signature of IUPAC's president Mark Cesa.

YAC event: Wednesday November 26, 2014

After lunch we leave for the open space on the 1st floor in the Chamchuri Square Shopping Mall. Around 70 students (50 expected) are waiting for us, but the teachers are well prepared, so able to improvise. Our 2 lady speakers are doing a great job warming up the audience for things to come. Prof. Vudhichai Parasuk (Chair of the Chemistry Department, Faculty of Science, Chulalongkorn University), Ganigar Chen (Director Office of Public Awareness of Science, National Science Museum, Thailand), Pornticha Wongyannava (Corporate Citizenship Assistant Manager, Dow Chemical Thailand) and Prof. Tantayanon officially open the YAC event on the podium in front of the YAC banner. The students can start their practical work immediately, everything needed is clearly positioned on different tables with teachers available to help. Our roving student reporters invite the visiting public to their tables, so other students in the group can show their work. All roving reporters manage to collect 45 completed questionnaires about the public's image of chemistry. Most groups consist of a number of great actors during showing their 30 sec TV promotion.

Prof. Vudhichai Parasuk officially opens the public YAC event Thailand.

Ganigar Chen welcomes the students, teachers and the public.

Nichapa Donkunha (left) and Pornsawan Krajangsod, our 2 lady speakers, doing a great promotion job!

Aerial view of the open space in Chamchuri Square Shopping Mall with part of the participating students and teachers

Students prepare their 30 seconds TV spot in a corner on the floor.

Beautiful products designed by a group of 4 students

"If you use our new shampoo your hair will get as colourful as mine!"

Accompanying promotion material with product information

Our distinguished jury: (left to right) Prof. Tantayanon, Maslin, Prof. Sukhummek, Pornticha Wongyannava and Sarocha

Prof. Tantayanon officially closes the YAC event Thailand.

Pornticha Wongyannava thanks all participating students and offers presents on behalf of Dow Chemical Thailand

Our distinguished jury (Prof. Tantayanon, Maslin, Prof. Sukhummek, Pornticha Wongyannava and Sarocha) decides after counting scores and discussing on winning groups. These groups get presents from Taiwan and the Netherlands, Chulalongkorn University and Dow Chemical Thailand. We don't say goodbye before a group picture with students and teachers is taken. ***The end of a glorious Young Ambassadors of Chemistry course and event in Bangkok!***

All students, teachers and organisers involved in YAC Thailand

Picture gallery

Website: https://picasaweb.google.com/112105353391375810743/YACThailand2014

Media coverage

Dow Chemicals (Thailand) helped with collecting clippings of the publicity around the 1st YAC Thailand. Between November 24 and December 29, 2014 Prof. Tantayanon receives 17 clippings from 11 different media as publications on paper, blogs and websites with pictures, picture galleries and a few videos, also including an interview with Prof. Tantayanon.

A survey of the headlines:

- Chemical Society of Thailand invites the youth join activity in Young Ambassadors for Chemistry (YAC) projects;
- Showing youth science performance;
- CST organizes project of the 1st Young Ambassadors for Chemistry (YAC) in Thailand;
- Young Ambassadors for Chemistry (YAC);
- CST collaborated with Dow Chemical (Thailand) and 3 partners jointly organized project of the 1st Young Ambassadors for Chemistry (YAC) in Thailand to encourage Thai youth dissemination of chemistry knowledge to the public;
- Young Ambassadors for Chemistry reaches to stage of the world.

Examples:

สมาคมเคมีแห่งประเทศไทยฯ เชิญชวนเด็กๆ และเยาวชน ร่วมกิจกรรมโครงการ Young Ambassador for Chemistry (YAC)

ข่าวประชาสัมพันธ์ทั่วไป วันจันทร์ที่ ๒๔ พฤศจิกายน พ.ศ. ๒๕๕๗ ๑๙:๐๘ น.

ขนาดตัวอักษร: ใหญ่ กลาง เล็ก Share 0 Like 0 Tweet 0

กรุงเทพฯ--24 พ.ย.--สยาม พีอาร์ คอนซัลแทนท์

สมาคมเคมีแห่งประเทศไทยในพระอุปถัมภ์ของศาสตราจารย์ดร.สมเด็จพระเจ้าลูกเธอเจ้าฟ้าจุฬาภรณวลัยลักษณ์ อัครราชกุมารี ภาควิชาเคมี คณะวิทยาศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ร่วมกับ International Union of Pure and Applied Chemistry (IUPAC) และ กลุ่มบริษัท ดาว ประเทศไทย จำกัด ขอเชิญชวน เด็กนักเรียน เยาวชน และผู้สนใจวิทยาศาสตร์ ร่วมชมการแสดงความสามารถของนักเรียนระดับมัธยมศึกษา ในโครงการ Young Ambassador for Chemistry (YAC) และเป็นผู้แทนในการเผยแพร่ส่งต่อความรู้ความเข้าใจเรื่องเคมีที่ถูกต้องสู่สังคม พร้อมพัฒนาความสามารถและสร้างจิตสำนึกของการเป็นทูตเยาวชนวิทยาศาสตร์ในอนาคต ผ่านรูปแบบการสาธิตการทำผลิตภัณฑ์จากเคมี โดยมุ่งเสนอผลิตภัณฑ์ใกล้ตัว ที่ใช้กันในชีวิตประจำวัน เช่น แชมพู ครีมทาผิว เจลใส่ผม เป็นต้น ในวันที่ 26 พฤศจิกายน 2557 ณ องค์การพิพิธภัณฑ์วิทยาศาสตร์แห่งชาติ อาคารจามจุรีสแควร์ ชั้น 1 ตั้งแต่เวลา 14.00-16.00น. งานนี้ พลาดไม่ได้! ทั้งความรู้และความสนุกสนานกับเรื่องๆ ง่ายของวิทยาศาสตร์ ที่จะทำให้ท่านรู้ว่าวิทยาศาสตร์ ทั้งสนุก ปลอดภัยและไม่ยากอย่างที่คิด

Example of publication on www.newswit.com

Chemical Society of Thailand (CST) and Chulalongkorn University collaborated with IUPAC, the National Science Museum and Dow Chemical (Thailand) invite the youth who are interested in science participate in showing high school student to promote public understanding of chemistry via the use of daily life products, such as shampoo, lotion, etc. The event held at National Science Museum (NSM), 1st floor Chamchuri Square on November 26, 2014 from 2.00 – 6.00 pm.

Translation in English

โครงการ Young Ambassador for Chemistry (YAC) ถูกจัดตั้งขึ้นเป็นครั้งแรกของประเทศไทย โดยสมาคมเคมีแห่งประเทศไทยในพระอุปถัมภ์ของศาสตราจารย์ ดร.สมเด็จพระเจ้าลูกเธอเจ้าฟ้าจุฬาภรณ์วลัยลักษณ์อัครราชกุมารี ร่วมกับบริษัทดาว ประเทศไทย และหน่วยงานที่มีความพร้อมด้านการสื่อการเรียนรู้วิทยาศาสตร์ภาควิชาเคมี คณะวิทยาศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย องค์การพิพิธภัณฑ์วิทยาศาสตร์แห่งชาติ (อพวช.) และสหภาพเคมีบริสุทธิ์และประยุกต์ระหว่างประเทศ (IUPAC)

โดยเน้นการส่งเสริมและพัฒนาทักษะการสื่อสารทางวิทยาศาสตร์ ในการเผยแพร่ส่งต่อความรู้ความเข้าใจเรื่องเคมีที่ถูกต้องสู่สาธารณชน ภายใต้รูปแบบที่เรียกว่า Train the Trainers ซึ่งถือเป็นรูปแบบที่ได้รับการยอมรับว่าเป็นโปรแกรมการศึกษาวิทยาศาสตร์ระดับโลกที่ประสบความสำเร็จมาแล้วกว่า 30 ประเทศทั่วโลก ในการฝึกอบรมครู และจัดหาทรัพยากรเพื่อพัฒนาทักษะการสื่อสารให้แก่เยาวชน รวมถึงการประเมินผลการฝึกอบรมผู้ที่จะเป็นผู้อบรมต่อไปในการเพิ่มความเข้าใจของสาธารณชนเกี่ยวกับเคมีมากขึ้น

กิจกรรมครั้งนี้ เป็นการจัดอบรมเชิงปฏิบัติการ โดยมีผู้เชี่ยวชาญจากคณะ

Interview with Prof. Tantayanon in Prachachat Turakij

Evaluations

We distinguish evaluations with the public, students, teachers and the organisers.

Public

Public: Image of chemistry

As for the public, we find that 79% of the public has a positive image of chemistry compared to 21% with a negative image. Main reasons:

Positive:

- I like chemistry;
- Chemistry is around and close to our daily life;
- I like hand made products;
- This makes me better understand chemistry.

Negative:

- I am not familiar with chemistry;
- It is hard to understand if you are not working in this field;
- Actually, I didn't like chemistry, but after the students in this workshop introduced me to chemistry, my preference changed.

Public: Importance of chemistry to our daily life

98% of the public considers chemistry is important to our daily life. Reasons include:

- Everything in daily life is composed of chemicals;
- I can make a new product from surrounding materials;
- If I know much more about chemistry, it will allow me to reduce the risk and use less harmful chemicals.

Public: Background knowledge about chemistry

7% of the public expressed they know a lot regarding chemistry, 47% considered themselves having fair knowledge, while 47% expressed they only know a few concepts of chemistry.

Public: Value of the YAC activity

94% of the public highly value the hands-on activity for teaching students chemistry. They mention:

- it is learning by doing;
- producing products make students better understand and remember chemistry;
- it is great fun and exciting when the student starts making and admiring his/her products.

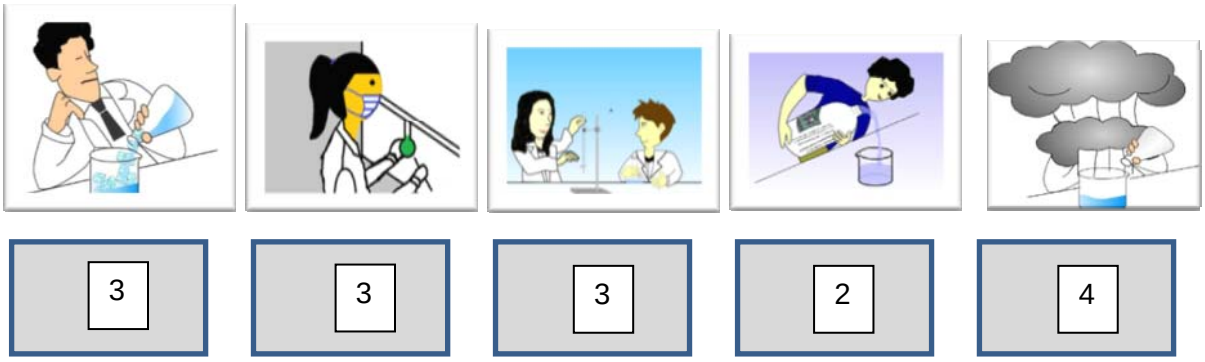
Public: Channels of knowing about chemistry

About 37% of the public know about chemistry through internet, 28% think they would learn chemistry better, if they could do activities as the students do and 25% mention to gain knowledge from TV, 7% from newspapers and 2% from radio.

Public: Images of chemists

Question:

Which one of the following pictures shows best what you think about chemistry? Number the pictures in your order of preference, with 1 under the picture that reminds you most of chemistry and a 5 under the picture that reminds you least of chemistry.



In an open-ended question, the public reflected on the YAC event:

(1) very useful activity;
(2) more promoting of the event should have been done;
(3) wider areas for public access needed;
(4) presentation of student's work very creative.

Teachers and Students

	Teachers	**Students**
If we hold similar activities, would you like to participate again?	Yes/No(%): 100/0	Yes/No(%): 93.3/6.7
Why?	• The experience from this event can be applied to the classroom. • Real doing, real practice, useful event, more fun, outside classroom learning and practicing English for communication.	• We got experience and knowledge outside the classroom. • We enjoyed with this activity and the gained knowledge can be applied in daily life. • We can make a new friend and try to make products.

strongly agree ↔ strongly disagree **……..○,5 ↔ ○,1**	$\bar{x}$ **(S.D.)**	
	Teachers	**Students**
After this activity, I acquire more about the application of chemistry in our daily life.	4.51 (0.559)	4.24 (0.645)
I am satisfied with the content of teaching materials of this activity.	4.38 (0.402)	4.24 (0.645)
I am earnest to participant in this activity.	4.57 (0.502)	4.51 (0.661)
I think I learn much from this activity.	4.41 (0.644)	4.38 (0.650)
I think this activity is valuable and it should be held more often.	4.49 (0.692)	4.31 (0.701)
Before this activity my image of chemistry was positive.	-	4.42 (0.657)
After this activity my image of chemistry is positive.	-	4.53 (0.658)
I think it's meaningful to encourage students to communicate with foreign students by using internet resources.	4.70 (0.571)	-

strongly agree ↔ strongly disagree **…….○,5 ↔ ○,1**	$\bar{x}$ (S.D.)
	Language teachers
After this activity, I acquire more about the application of chemistry in our daily life.	2.41 (1.18)
I am satisfied with the content of teaching materials of this activity.	4.53 (0.51)
I am earnest to participant in this activity.	4.00 (0.60)

Teachers	
Will you apply what you learned in this activity in your future teaching?	Yes/No/No response (%): 97/0/3
If yes, how?	• I will apply this activity to some lessons in chemistry class or science show activity in school. • This can encourage skills and attitude in chemistry of student. • Teacher can design learning activity by using Thai herbs instead of some chemicals. • By making colorful products, teacher can reduce cost for making products by using natural dyes such as red color from rose or purple from butterfly pea instead of synthesized color.

What did you learn from this activity?	• I gained a lot more knowledge about chemistry in daily life. • It is easy to make and apply to classroom. • To encourage and motivate the student interested in chemistry, the teacher should have an interesting teaching methodology and apply the teaching in everyday life involved in the lesson.
What do we need to improve about the courses and hands-on activities in this workshop?	• It is so short for making four products and thinking of how to present products so the time of this workshop should be longer. • This workshop should add more hands-on activities.
What do we need to improve about arrangements in this workshop?	• The time for student training should be longer. • The organizer should provide the opportunity for the teacher to practice English speaking with the speaker from IUPAC. • This workshop should be promoted more for public. • The location should be more passed over by public.
Other opinions?	• Because this event is very effective, it should be ongoing activity and extended to the community. • I want to say thank you for English translation of Dr. Supawan and Dr. Boonnak.

We are very satisfied with all answers written down!

Organisers

Prof. Tantayanon filled in our questionnaire. Most of her answers are incorporated in this report. She will introduce the whole report to the national meeting of Chemistry Department Heads and discuss possibilities for organizing more YAC events. She will also present the results of our evaluations with the present public, the participating students (during the YAC event) and teachers (during the YAC event and the 1.5 day YAC course) to the Chemistry Department Heads at their national meeting.

Our conclusion from remarks about the course/training mainly suggest a little more time (3 days?) to work with and train the teachers will be needed.

Acknowledgements

Chulalongkorn University

Chemical Society of Thailand

National Science Museum

Dow Chemical Thailand

- Department of Chemistry, Chulalongkorn University, Bangkok for facilitating (lecturer, partial costs of the venue) and organising the YAC course and event;
- Chemical Society of Thailand (CST) for facilitating (hard copies) and organising the YAC course and rented the venue for the YAC event in the Chamchuri Square Shopping Mall;
- Dow Chemical Thailand for overall financial support in organizing YAC Thailand, including local transport for the teachers, meals, accommodation for a few participants and presents for the students;
- National Science Museum (NSM) for providing the training room, equipment, lunches and coffee breaks;
- IUPAC for facilitating travel expenses for Mei-Hung Chiu and Lida Schoen;
- Prof. Supawan Tantayanon and her staff for perfect organisation;
- Barentz Pharma & Cosmetics, the Netherlands for donating the emulsifier Tinci (Guangzhou Tinci Materials Technology Co., Ltd (www.tinci.com);
- Florale Haircare Group for donating professional ‘cream’ jars (www.floralehaircare.com).

Text

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Pictures

Mei-Hung Chiu and Lida Schoen

March 2015