



## International Council of Associations for Science Education

### Report on School Visit on 10 March 2014 at Guangxi, China

#### 1 Visit to Liuzhou High School (in the morning)

We were warmly welcomed by the Principal and his staff and immediately taken for a brief tour of the new and impressive campus. Externally, looking at the buildings and landscapes, it would appear like a modern college. Along the 'Cultural Verandah' there were large posters displaying about their science and technology programmes, as well as various academic activities and achievements.



Warmly welcomed by the principal



Part of the school building



We were then ushered into a classroom to observe a chemistry lesson. There were 70 students seated in pairs of 5 rows, each made up of 7 pairs of tables and chairs (total number of students presumably  $2 \times 7 \times 5$ ). It occurred to me that this was typically a traditional classroom style of arrangement. It appeared congested yet systematic. Throughout the lesson, the teacher was standing in front of the class. He moved only when he wanted to operate on the multi-media gadgets or writing on the whiteboard.



The demonstrated lesson (for Upper Secondary Year 1, equivalent to Grade 10) was about ‘The Equilibrium Law’ based on Le Chatelier's principle. Personally, I was impressed with the following observations:



Classroom set up for a Chemistry lesson



A portable chemicals and apparatus kit

(1) Using a well-known Three Kingdoms’ character, Cao-Cao, who at one stage did not brush his teeth because of tooth ache. Brushing teeth would upset the ‘equilibrium’ of the micro-environment in the mouth and hence causing pain. This way of linking science with a historical event would arouse curiosity and interest in the students to seek knowledge through science inquiry.

(2) The lesson was intentionally planned to relate a scientific principle for use in solving a daily environmental problem, i.e. manipulating chemical equilibrium in the clogged drain to dissolve solidified dirt to soluble substances to clear the drain. This offered a possible simple practical application of a scientific and technological approach in solving a daily prevalent socio-scientific and environmental problem.

(3) Using portable kits with chemicals, test tubes etc could turn a classroom into a instantaneous laboratory. Experiments could actually be carried out in the classroom with proper management and arrangement.

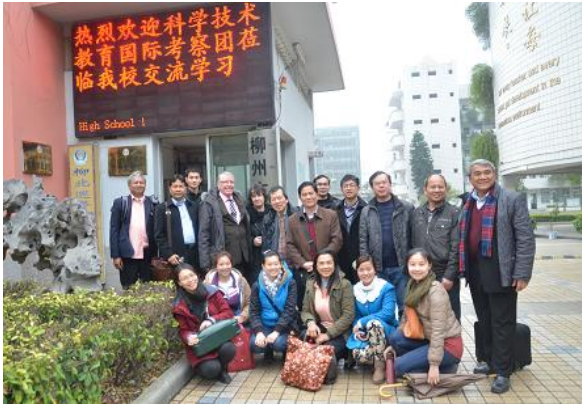
However, this type of ‘turning a classroom into a (chemical) laboratory’ set-up was observed to have the following ‘limitations’:

(1) It was difficult to administer safety precautions within limited spaces in the classroom. One of chemical reactions actually required heating a mixture in a test tube. Splitting hot liquid might cause injury if the test tube was pointing at someone while it was being heated. Fortunately, the students were prudent and this did not happen.



(2) In this lesson, the students were working in small groups across the classroom in three straight-line rows and thereby blocking mobility in the classroom. To ease the already congested condition, perhaps the groups of students should be arranged alternately in different rows to create more space for movement.

## 2 Visit to Liuzhou No. 9 Middle School (in the afternoon)



The visiting delegates and hosts in front of the school



Visiting a laboratory

The demonstration lesson was based on a unit in the curriculum of the Science and Technology Education. The unit requires the students, working cooperatively in groups of 6-8, to plan, design and build a stable bridge each using old newspapers. At this particularly lesson, they were at the stage of presenting their individual group designs to the whole class. In the presentation they explained their designs to withstand the weight and ensure stability of the bridges. Some of them related their inspirations and modelled their designs based on many bridges crossing at different parts of the Li River in their city.

After the presentation, two groups would exchange their designs and then studied carefully to offer critique on each other designs. This kind of cross-checking and discussion were very thought-provoking for designing and redesigning to attain the maximum benefits. After the presentation of each critique, the group of students concerned were asked to rethink and to redesign their proposal if necessary.



Interactive discussion



Redesigning their designs

This lesson clearly demonstrated the ‘designing’ process that would follow up by the ‘engineering’ stage in building the bridge. What was not observed within this

40-minute lesson was the discussion on the underlying scientific principles such as material strength and stability employed in the designing consideration. Of course, this would not be possible to discuss within this short lesson. Presumably, it must have been done at the 'pre-requisite' stage leading to the present attainment.



Providing critique



Standing on a previously constructed paper bridge

Overall, I think Science and Technology Education should position itself to inculcate scientific and technological literacy, and be encompassing and informative to enable humanity to make informed decision for the wellbeing for all in achieving the goal of sustainability in socio-economic and environmental development.

Reporter  
Lee Shok Mee  
SEAMEO RECSAM  
Penang, Malaysia

Prof. Jack Holbrook  
ICASE, Past President  
Chair,  
International Projects

Dr. Janchai Yingprayoon  
ICASE, Past President  
Chair,  
Science and Technology  
Education Centres