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National Changhua University of Education
No.1, Jin-De Road,
Changhua City, Taiwan
+886-4-7232105
fax: +886-4-7211178

Content Lists

In this issue:

The Editor of this Issue, Prof. SO at Hong Kong Institute of Education, collected many recent progresses and interesting reports in Hong Kong and some other regions. In addition to these, you can find reports concerning the successful 2012 EASE Summer School, which was held in Beijing Normal University (BNU) this August. Also, you can find important information about our next important event- the EASE 2013 Conference (p. 26). We invite you to add the schedule to your calendar. The responsible editor for the next Issue of the Newsletter is Prof. Jang WANG at BNU. The EASE Newsletter invites science educators in East-Asian to share research and news by sending your manuscripts to Prof. Wang or your regional editor (as listed in p.12) by December 15.

-Sung-Tao Lee, Chief Editor, National Taichung University of Education, Taiwan

Hong Kong

Opportunities for Open-Ended Science Inquiries in Hong Kong

Prof. Wing-Mui Winnie SO, Department of Science and Environmental Studies,
The Hong Kong Institute of Education, HONG KONG

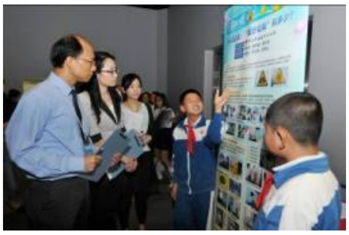
Background

The development of primary science education (Primary 1–6) in Hong Kong has been guided by the Suggested Syllabuses for Primary Schools: Nature Study and the Syllabuses for Primary Schools: Primary Science since the ’60s. However, in 1996, a new subject named General Studies (GS) was introduced and implemented in response to the recommendations of Education Commission Report No. 4 that different subject discipline of Primary Science, Health Education, and Social Studies should be integrated. The GS curriculum was further revised in accordance with the curriculum reform in the 2000s that integrated Personal, Social and Humanities Education, Science Education, and Technology Education.

There has been several science learning activities organized by various education organizations in Hong Kong in the past decade to promote students’ interest and develop active learners in science. They are “Innovative and Environmental Studies”; the “Hong Kong Budding Scientists Award”; and the “Hong Kong Youth Science and Technology Invention Competition”.

Among the various science learning activities, the “Innovative and Environmental Studies” (ISES), previously named the “Primary Science Project Exhibition” and the “Primary Science Project Competition”, has been operating since 1998 and involved over a hundred schools and a thousand students each year. ISES has been well received by students, teachers, and parents, and it has eventually become a platform for sharing science inquiry outcomes among primary students in Hong Kong and the Pearl Delta Regions of Mainland China. In order to complete the adjudication efficiently and effectively within the 2-day exhibition event, over 40 science educators are invited as adjudicators during the exhibition. The adjudicators are invited from different sectors in the related field including the EDB, the Hong Kong Science Museum, Universities, and local and Mainland Primary and Secondary Schools which have a strong science background.

To participate in the event, students have to work in groups with guidance and support from their teachers on their inquiry activities for appropriately 3 months. During the exhibition day, each team is assigned a booth table where students present the process and product of their science inquiry using multiple representations (i.e., a summary on a display board and the details in a written report). Students are very eager to explain their work orally to the audience, which includes students from other teams, parents, the public, and adjudicators. The students’ 15 minute oral presentations and written reports are assessed by the team of adjudicators. Snapshots of students’ presentations can be found in the website (http://www.hkedcity.net/ises/cht/whatsnew.html# [in Chinese]).


Display board


Model Display


Experiment result display

The written reports of the outstanding winning teams are edited and published in a booklet after the event, which makes it an annual publication. In addition to the students’ written reports, there are short articles, including an analysis of a key component of science inquiry of the project by the chairperson of the organization committee, and a written record of the speeches introducing the theme of study and key components of science inquiry by the invited speakers during the teacher and student workshops. They serve as useful references for the participants in science learning and project learning.

Besides, students’ projects are analyzed from various perspectives in academic articles to well support students and teachers with more knowledge and skills for their future participation in the future events. These include a discussion of integrating mathematics in science inquiry (So, 2012); myths of science (So & Zhong, 2009); and learning science through investigations (So, 2003) and etc.

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“Be thankful for what you have – You’ll end up having more.” – Oprah Winfrey, Talk Show Host

Is School-Based Assessment an Option for Your Country?

Prof. Benny Hin-Wai YUNG, University of Hong Kong

I have written widely on school-based assessment (SBA) of science practical work elsewhere (e.g. Yung 2000a, 2001b, 2002, 2006, 2012). Here, I want to offer some personal touches on the issues by recounting my own experiences in this area as a student, a teacher, an examination officer, a science education researcher and a science teacher educator.

Experiences as a student

As in countries in this region, an examination-oriented culture is firmly embedded in Hong Kong. Examinations are stressful both for students and teachers. I can still recall the experiences of preparing myself for the then A-Level Biology Practical Examination. For instance, soon after the typhoon signal had been withdrawn, I went out to a grass field to look for earthworms in the rain. On my way back home, I went to the market place to try my luck if I could get hold of a dogfish, a pig's heart or an ox eye. It would be a fortune for me if I could also pick up some dead bodies of cockroaches near the litter areas. I did these simply to provide myself with more opportunities to practice dissection of the animals or organs which were listed in practical examination syllabus!

However, there was one thing which I dared not to try my luck – the supply of rats near to the practical examination. For a guaranteed supply, like my classmates, I had to keep my own breed of rats inside a bird cage in my house. As a student, I had no choice, but to seek every opportunity to prepare myself for the high-stake examination in 1974. At that time, one-tenth of the students could get into the university. Given such keen competition for tertiary places, I thought that the practical examination was a fair way to screen people for the limited places. I had no idea of what could be a better alternative.

Experiences as a teacher

I became a teacher in 1977. In 1978, Hong Kong Examination Authority (HKEA) consulted the schools on introducing a SBA scheme to replace the then A-level Practical Examination. I was amongst the majority of teachers who did not support the proposal. Our main concern was fairness of the scheme. We were not convinced that the scheme could provide a fair assessment of students' work because of the great variations in marking standards by teachers in different schools. Without support from teachers, the proposal did not go through in the end.

In the years to follow, like my counterparts, I had to do everything possible for my students to ensure their successes in the examination. I was drilling my students on those stereotyped practical work that were likely to appear in the practical examination, in particular, rat dissection. Until one day, I discovered my students set up and managed their own 'animal house' at the roof top of the school, the sanitary condition of which was so poor that I had to stop them from breeding the rats any more.

In sum, the limited types of practical activities that were examined in the practical examination had highly distorted the curriculum. The teachers, including myself, might know about the problem. But they couldn't help because it was just too risky for them to deviate from the norm. They would be reprimanded by the school principal, parents and students alike, for not doing a proper job – preparing students for the high-stake examination.

Experiences as an examination officer

In 1986, I joined HKEA. In 1990, I was charged with the responsibility to carry out a feasibility study of replacing the A-level Practical Examination by a SBA scheme. The study turned out to be a fruitful one. HKEA finally decided to implement a new SBA scheme from 1993 onward. It was a great relief for me, anticipating that I didn't need to be bothered by problems associated with the practical examination anymore. These include the constraints of running the practical examination, and the difficulties of adjusting marks between different groups of candidates sitting for the examination on different examination dates, etc. In sum, the more I knew about problems of running the practical examination, the sooner I had wanted to look for a better alternative.

Experiences as a researcher and a teacher educator

In 1993, I joined University of Hong Kong. In 1995, I started a five-year study entitled Teacher Beliefs and their Teaching of Practical Work. I observed ten teachers in their schools as they tried to change their classroom practice of teaching practical work following the implementation of the SBA. From the study, I realized that teachers' practice could not be changed simply by implementing a new assessment scheme. There were teething problems to be addressed. One of the intriguing findings was: while all teachers were concerned about fairness of the scheme, they held three different views of fairness (Yung, 2001a). Underlying their different views of fairness was their confidence in engaging themselves with changes required of them in the new assessment scheme. As a teacher educator, I realized that if teachers are to regain their professional confidence and play a significant role in the assessment reform, they need to engage with changes, rather than be taken over by them. In order to do that, they need to understand the origins and nature of the changes, and their own responses to them (Yung, 2002). These goals can never be achieved through one-off teacher training workshops (Yung, 2001b, 2006, 2012).

In 2011, I was invited to speak in the Ministry of Education of Singapore on how to improve their SBA. I searched for examples from around the world to prepare my talk. I was attracted to the SBA system in Queensland. Not only did I admire the comprehensive support they provide for teachers, but the guiding principle underlying the design of their system. It is the notion of 'humanizing assessment' – where they denounce the traditional grading technologies and value schooling as a more co-operative enterprise between teachers and pupils.

This notion of 'humanizing assessment' reminded me of a Mainland China student in a M.Ed. class where we were discussing the SBA system in Hong Kong. Though this student admired our system very much, she thought that it just won't work in Mainland China. I suspect that the case of Queensland would be just unthinkable for this particular student. This is because, in China, the community sees examinations as a trusted mechanism for achieving social aspirations. For example, almost one million people sat for China's 2010 national examination for admissions to the civil service in Hubei Province. It looks as if this is just a modern version of the Civil Service Examinations of Imperial China.

So in my talk to colleagues in Singapore, I made the following concluding remark. Education as a whole and assessment in particular, is a strongly cultural phenomenon. In the era of globalization, every country has to be very careful in seeking for an assessment system which is best for its own settings. In the process, due consideration must be given to concerns of different stakeholders, in particular, the teachers since they are the mediators of any assessment reforms.

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Infusing Digital Technology into Inquiry Learning in Hong Kong Primary School
A Cross-Sequential Design Project

Dr Yau-yuen YEUNG, Prof. Wing-Mui Winnie SO, Dr Zhihong WAN, Department of Science and Environmental Studies, The Hong Kong Institute of Education, HONG KONG

With the interest to enhance students' inquiry learning in General Studies lessons through using digital technologies, a two-year project, supported by the Hong Kong Quality Education Fund, was initiated in 2010 by a Hong Kong primary girls' school. The project members implemented this project in the General Studies lessons of 4 grades, i.e., Grades 3 to Grade 6. The topics selected for the infusion of digital technologies in inquiry learning at these grades were *Living in Hong Kong*, *Light*, *Electricity*, and *Simple Mechanics*. For each topic, both project-base learning (PBL) and scientific inquiry (SI) activities were designed. Grade 3 and Grade 4 started with PBL activities and then guided students to investigate scientific questions generated from the preceding PBL activities. For Grade 5 and Grade 6, students were required to probe scientific questions first and then made use of the scientific knowledge learned in the preceding scientific inquiry to design some products.

Data logger was the major digital equipment used at each grade. To meet the requirement of primary students, a data-logging device that can work without an additional computer was selected. The touch screen can show the figure and generate an instant graph. Data were collected through the sound, light, current, voltage, force sensors in the inquiry activities and then inputted into data logger. Besides, camera and computer were also used.

Since General Studies teachers had very little experience of using digital technologies in inquiry lessons, the school-based support was provided by a group of educators from the Hong Kong Institute of Education (HKIEd). Four workshops, entitled *Inquiry Learning: Theory and Practice*, *An Overview of Digital Technology in Education*, *Digital Technology in Inquiry Learning*, and *Examples & Assessment: Using Digital Technology in General Studies*, had been conducted to strength teachers' expertise of applying digital technologies in inquiry activities. A total of 28 meetings were hold between HKIEd educators and teachers to discuss the design of inquiry activities. Thirty-six lessons were observed. After each of the observed lessons, HKIEd educators had a very brief talk with teachers on the critical incidents in the lessons, and gave some suggestions, if necessary, for other teachers who had not taught this lesson. For each grade, two meetings were held to reflect respectively on PBL and SI activities. Besides, tests and questionnaires were delivered to evaluate student's development in knowledge, skills and attitude.

The project followed a cross-sequential design. It started in the 2010–2011 academic year with Grades 3 and 5. The same students undergo a follow-up when upgraded to Grades 4 and 6 in the second academic year, i.e., 2011–2012. Through this design, the project was conducted in four grades within two years. Actually, there were also other options. For example, we could start with all 4 grades in the first year and revise the design in the second year. However, the design of the activities for each grade all needs considerable input of time and efforts. The introduction of these activities also required to adjust the existing curriculum. If we adopted this option, too dramatic change would be brought and too much manpower would be involved within a short period. Of course, it was secure to start the activities with one grade in one year, but such option would make the project last 4 years, but we worried that it would make the project last too long. At the end, after comparing different plans, the project member decided to choose a balanced solution, i.e., the cross-sequential design.

The goals of this project are to create an exemplary learning environment using digital technologies in primary school, develop an innovative school-based inquiry curriculum, cultivate students' inquiry skills, and enhance General Studies teachers' professional knowledge and teaching abilities.

世の中に失敗というものはない。 チャレンジしているうちは失敗はない。 あきらめた 時が失敗である。 —— 稲盛和夫

인생은 하나의 실험이다. 실험이 많아질수록 당신은 더 좋은 사람이 된다.

My Story from a Scientist to a Science Educator: From Research on Nanostructures to Research in Nature of Science

Prof. Siu-Ling WONG, Faculty of Education, The University of Hong Kong

The words 'nature of science' (NOS) only began to attract greater attention of stakeholders in the Hong Kong science education community (including curriculum developers, teacher educators, and teachers) at the turn of the 21st century. I was also among them when I first joined the Faculty of Education at the University of Hong Kong (HKU) in 2002. I was excited to know that understanding NOS is advocated explicitly as a new curriculum goal of science education in the New Senior Secondary Curriculum in Hong Kong and the new National Curriculum Standards documents in mainland China to be implemented in a few year's time then. Having experienced the local science education in my own schooling and having been a scientist doing research on nanostructures for many years before becoming a science educator, I saw the inadequacy of over-emphasis on the products of science (subject knowledge), and noted how little discussion was directed to the nature of and process of generation of that knowledge in the Hong Kong science classrooms. I was excited by the advocacy of the new curriculum goal and believed that students would learn science with greater effectiveness and joy through appreciation of a fuller and richer picture of science. Naturally I became interested in researching in the area of NOS and started reviewing the literature in the area.

While I was very much inspired by the work of big names like Lederman, McComas, Osborne, etc., I was also surprised to note that despite a huge body of literature dedicated to the research area of NOS, there are only a handful of studies capitalizing on the practice of scientists about the characteristics of science. If understanding NOS involves consideration of questions like "What is science?", "What do scientists do?", "How is scientific knowledge constructed and validated?", "How do scientists operate as a social group and how does society itself both direct and react to scientific endeavours?", it would make sense to include the voices of scientists in addition to descriptions largely based on studies by philosophers, historians and sociologists of science or researchers in science education. The urge to take action to directly ask and listen to eminent scientists' views about NOS, based on their reflections on their own authentic practice in conducting scientific research, was also prompted by my skepticism of an apparent international consensus of basic elements of NOS that should be taught at the school level (McComas and Olson, 1998; Lederman et al., 2002; Osborne et al., 2003) Such a generalised list of NOS aspects appeared to me as neither correct nor productive, and some did not accord with my own earlier experiences as a researcher in physics. I then thought, 'perhaps this is an important piece of missing information which I could help fill up with my dual experience in research in science and science education by mediating voices between the scientific community and the science education community.' This was how I started to approach scientists from various disciplines, including those working at the frontiers of science, to provide authentic examples from their practice in explicating the contextual and sophisticated nature of science. The arrival of Prof Derek Hodson as a Distinguished Visiting Professor to our Faculty in 2004-2006 gave me invaluable and timely guidance. The great mentorship and friendship of Derek and subsequent inspiring encounters with other world renowned science educators supported by our Faculty Visitor Scheme including David Treagust, Norm and Judy Lederman, John Gilbert, Michael Matthews, Dana Zeidler, Sibel Erduran, Bev France, Jonathan Osborne, etc. accelerated and smoothened my transition from a scientist to a science education researcher, and the transition from publishing science research articles to science education articles (Wong & Hodson, 2009; Wong & Hodson; 2010). With these favourable research outcomes, the science education team at HKU have been turning the research findings into teacher professional development to enhance teachers' understanding about NOS (Wong et al., 2008; Wong et al, 2009), skills in teaching NOS (Wong, Wan & Cheng, 2011), attitude in teaching NOS (Wong, 2012). These fruitful projects have also attracted many good research students to work on studies related to NOS (Wan, Wong & Yung, 2011; Wan, Wong & Zhan, 2012). It is also very encouraging to have the paper entitled "From the horse's mouth: What scientists say about scientific investigation and scientific knowledge" to receive the 2010 Research Output Prize awarded by HKU for its scholarly contributions to the field.

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A Preliminary Framework for Teaching About the Nature of Science

Prof. Kwok-chi LAU, Department of Curriculum and Instruction, The Chinese University of Hong Kong

Introduction

Understanding nature of science (NOS) is widely recognized by science educators as one of the central goals of science education (Lederman, 2007). Research on NOS, however, largely focuses on "students and teacher characteristics or curriculum development to the exclusion of any direct focus on *actual classroom practice* and/or *teacher behaviors*" (Lederman, 2007, p. 853). To explore the classroom teaching of NOS, a framework is needed to depict how NOS teaching is done in different classrooms, and from which judgment can be made on its strengths and weaknesses. This study seeks to develop a preliminary framework for NOS instruction, which is both descriptive and prescriptive. The framework will draw on the empirical findings of this study as well as the literature on NOS teaching in particular and, science teaching in general.

Methods

This study employs a *multiple case study* research design to study how eight secondary science teachers in Hong Kong teach NOS in actual classrooms. These teachers have participated in a NOS teaching course taught by the researcher as part of their pre-service/in-service education programs. The data included teaching videos and transcripts, audio records of the interviews with the participants, teaching plans, teaching materials, the participants' self-reflections. The teaching transcripts were read through, segmented and coded, and examined for evidence of desirable and undesirable NOS teaching practices.

Findings and discussion

Based on the empirical findings of this study, and the NOS teaching literature, a preliminary framework for NOS teaching was developed (Table 1).

Accuracy of NOS aspects

The literature only describes the NOS conceptions delivered by teachers as either *naïve* or *informed*, but, this study found that many of the NOS aspects delivered by the teachers in class were neither naïve nor informed, but oversimplified. A teacher said, "law and theory are at the same level. Laws are describing things, theory explains things…", which seemed an informed NOS understanding, but were hardly comprehensible for students due to being oversimplified and highly abstract.

One important feature of this framework is to distinguish general aspects of NOS from the contextualized ones. Naïve NOS aspects were often made when teachers attempted to explain them in particular *contexts*. One teacher rightly said that observation was theory-laden, but she explained Leeuwenhoek seeing a miniature human in the sperm a result of the limitations of microscopes, instead of the *preformation theory*.

On the other hand, even an NOS aspect is informed in a context, it could be naive for science *in general*. In one lesson, students were shown that both the theories of asteroid impact and volcano eruption can adequately explain the dinosaur extinction, accurately illustrating the problems of *underdetermination* between evidence and theory. However, most, though not all, of the well–established scientific theories do not have an alternative counterpart as in this case, such as the theory of evolution by natural selection and the atomic theory. Thus, the case of dinosaur extinction can accurately show a facet of NOS but that is not applicable to science in general. To provide a more balanced and NOS understanding, a contextual NOS aspect has to be followed by a discussion on its applicability to science in general.

Table 1 A preliminary framework for NOS teaching

Dimension A: Accuracy of NOS aspects (low → high)		
Naïve NOS aspects *Contextualized ↔ General*	Oversimplified NOS aspects *Contextualized ↔ General*	Informed NOS aspects *Contextualized ↔ General*
Dimension B: Contexts for NOS teaching (Unauthentic science → Authentic science)		
Decontextualized, generic NOS activities	-School lab activities: *experiences → verification → investigations* *(closed → open-ended)* -Science concepts	-Science history -Socioscientific issues
Dimension C: Intelligibility and plausibility of NOS aspects (low → high)		
General NOS aspects without elaboration in contexts	Contextualized NOS aspects *in oversimplified contexts → in interesting and accessible contexts → in rich and authentic contexts*	
Dimension D: Explicitness/reflectiveness of NOS teaching (low → high)		
Implicit - no explicit attention to NOS aspects	Explicit attention to NOS aspects: *Contextualized → general*	Engagement of students in *reflection* of their own ideas on NOS: *Contextualized → general*
Dimension E: Communicative approach (Teacher ideas dominating → Student ideas dominating and worked on)		
Non-interactive/ authoritative	Non - interactive/ dialogic	Interactive/authoritative; Interactive/dialogic

Contexts for NOS teaching

This Dimension draws mainly on the framework proposed by Clough (2006), which conceptualizes the contexts according to the extent they are like *authentic science*. The more authentic the contexts, the more likely students will exit instruction with conceptual change on their NOS ideas about formal science.

The least authentic context is the decontextualized, generic NOS activities, like the Tricky Tracks and use of gestalt switches. These content-free, puzzle-solving black box activities simulate scientific inquiry but are not science. These activities were welcomed by the teachers in the study as they were simple and interesting to the students.

School lab inquiry differs considerably from real science (Chinn & Malhotra, 2002) so they are considered less authentic than science history and SSIs. However, not all kinds of lab activities are equally good for NOS teaching NOS, and only extended, open-ended investigation can capture many of the important features of real scientific inquiry. None of the teachers in this study chose lab inquiry to teach about NOS, because they found it highly challenging to engage students in open investigations, not to mention extracting the NOS elements in the process.

A new context is added to Clough's framework: *science concepts,* such as using Mendel's laws to teach about scientific laws and theories. It focuses largely on the concepts themselves to the exclusion of the historical and social milieu. This makes this context less authentic than the history of science. As revealed by the teachers in this study, this is probably the least-resistant context for NOS teaching because it addresses the imperative goal of content learning in science education.

History of science represents the highly authentic contexts for NOS teaching. However, existing use of science history in science textbooks is largely haphazard insertion of short vignettes, which is often oversimplified, inaccurate or even erroneous and thus contribute minimally to the learning of NOS. In this study, the historical cases prepared by the teachers themselves were largely oversimplified.

Socioscientific issues (SSIs) probably represent more 'authentic' science than historical cases since they are actually occurring around us and largely unresolved. However, none of the teachers in this study used SSIs, probably because they involve frontier knowledge of science and technology that are beyond the reach of teachers and students.

Intelligibility and plausibility of NOS aspects

An accurate account of NOS in an authentic context is not necessarily intelligible and plausible to students, which are crucial for conceptual change (Posner et al., 1982). Generic NOS statements not elaborated with examples are hardly intelligible and likely produce rote learning. An oversimplified context is so problematic. A case in point is that a teacher cited Einstein's theory of relativity to show the revolutionary nature of science, but made no attempt to explain why Einstein's theory represents a paradigm shift from Newtonian mechanics. On the contrary, with the authentic case of the discovery of H. Pylori in stomach, one teacher can convincingly show students many NOS aspects. So it is vital to construct a rich and interesting context to make the NOS aspects intelligible and plausible to students.

Explicitness/reflectiveness of NOS teaching

This Dimension is based on the well-researched implicit and explicit/reflective approaches to NOS teaching in the literature (Lederman, 2007). Though *explicit, reflective* approach has been widely promoted for NOS teaching, it is far from clear what 'reflective' means in actual classrooms. Lederman (2006) put it as engaging students in discussion of "the way they view scientists, scientific knowledge, and practice of science." (p. 312). So a reflective talk is metacognitive and personal. Most of the participants in this study failed to engage students in reflective discourse, which likely demands much on the teachers' capabilities in dialogic interaction as discussed below.

Communicative approach

This dimension has drawn on the works of Mortimer and Scott (2003) and Ryder and Leach (2008), in which the *interactive/non-interactive* dimension refers to the extent students are allowed to express their ideas in class, whereas the *authoritative/dialogic* dimension indicates the extent students' ideas are heard, respected, explored, and worked on (Mortimer & Scott, 2003, p.34).

Reflective discourse likely occurs when the teaching is interactive/dialogic, while a non-interactive/authoritative classroom would have minimal reflection. Most of the lessons observed in this study were interactive to some extent, but interactions were mostly limited to probing of simple ideas in IRE patterns. Students' ideas were seldom elaborated, challenged, and worked on thereafter. Under most circumstances, the teacher dominated the discussion, giving superficial, authoritative interactivity.

Conclusion

The framework is provisional and limited in its generalizability due to its limited numbers of classes and teachers involved. This framework, however, could provide a useful tool for NOS researchers to characterize NOS teaching in order to judge its quality based on its process, rather than its products. As such, NOS teaching is no longer treated as a black box in the conventional input-output study; rather, as complex interplay among the five dimensions. For science teachers, this framework also provides clearer guidelines on the key characteristics of NOS teaching that are likely to enhance NOS learning.

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Astronomy Education in Hong Kong

Prof. Ping-wai KWOK, Department of Science and Environmental Studies, The Hong Kong Institute of Education

Astronomy is the oldest science subject which began in many ancient civilizations more than two thousand years ago. Long before physics, chemistry and biology established as separate disciplines, astronomy, music, geometry, arithmetic, grammar, rhetoric and logic were already included in the basic curricula in Europe during the Middle Ages. Yet, nowadays, in Hong Kong, astronomy only plays a minor role in the primary and secondary curricula.

In the primary education, topics in astronomy are under the subject General Studies [1]. These topics are arranged to be taught in the final year of the primary education. They take up about 10% of the content of the final year textbook. However, it is very unfortunate that errors on the astronomical knowledge are not uncommon in these textbooks.

In the secondary curriculum, astronomy was not included prior to the implementation of New Senior Secondary (NSS) curriculum in 2009. The NSS physics curriculum consists of a compulsory part and an elective part [2]. In the elective part, students can choose any two of the four topics of which "Astronomy and Space science" is among one of the choices. Each topic takes up 27 hours, which is 10% of the total lesson time of the 3-year physics curriculum.

Visit to the Astropark at Sai Kung, Hong Kong. Exhibits of the Astropark: Pavilion cum mini-planetarium (left), Armillary Sphere (渾儀) (right) and Human Sundial (ground)

Although students have the option to choose astronomy as the elective, in reality, the schools decide the two elective topics for the students because of several limitations. The schools consider factors such as, manpower and timetable constraint to offer all four electives, teacher training and the enthusiasm of teachers in deciding whether astronomy elective is available to students or not. Moreover, some physics teachers are unfamiliar with the content and do not feel confident in teaching the astronomy elective part.

In Hong Kong tertiary education, astronomy is available as a minor or major only in recent years at the University of Hong Kong. In other tertiary institutions in Hong Kong, astronomy is taught as an optional general education course for all students. More technical and advanced astronomy courses are offered by the physics departments as optional courses for their physics major students. Thus even physics major students may not have studied astronomy in their undergraduate education. The lack of training in astronomy deters many physics teachers from offering this elective to their students.

In the first examination of the NSS Physics curriculum in 2012, the number of candidates choosing astronomy in the elective part is about 5000 representing about one-third of all Physics candidates. The popularity of the astronomy elective part is below average.

Besides teacher training, lack of hands-on experience with the real phenomena and visualization of spatial relationship of celestial objects from different viewpoints pose challenges in teaching astronomy. Unlike physics, chemistry and biology which have many experimental activities, astronomy is mainly an observational science. There are not many laboratory works suitable for students in a school laboratory to be completed in one or two lessons. However, observation activities after sunset are difficult to schedule because of unforeseeable cloudy skies, light pollution, obstruction of views by high-rises, parental consent, and limited quantities of expensive equipments such as telescopes. In daytime, the Sun is the only target for observation activities. In order to arouse students' interest in the subject, we should seize the opportunity when the new sunspots cycle is about to peak in 2013, daytime observation of the Sun will be quite attractive.

To substitute real observation, the free open source planetarium software application Stellarium [3] is the next best option. It is a very popular and is used by many teachers to explain the motions of the celestial objects. Another good internet resource is the Nebraska Astronomy Applet Project [4]. The applets are interactive and are particularly suitable for students to explore astronomical phenomena involving spatial rotation and visualization.

There are also some public astronomical facilities which enrich the students' learning experiences. The Hong Kong Space Museum [5], the Astropark [6], and the iObservatory [7] are funded and managed by the Hong Kong Government. Other facilities run by the non-government bodies are Ho Koon Nature Education cum Astronomical Centre [8] and Ma Wan Solar telescope [9]. These public facilities not only supplement the classroom learning in the formal curriculum, it also provides a lifelong informal science learning experience for the general public, raising the scientific literacy about astronomy of the population of Hong Kong.

[1] http://www.edb.gov.hk/FileManager/EN/Content_2850/gs_p_guide-eng_300dpi-final%20version.pdf
[2] http://www.edb.gov.hk/FileManager/EN/Content_2855/phy_final_e_20091005.pdf
[3] http://www.stellarium.org/
[4] http://astro.unl.edu/naap/
[5] http://hk.space.museum/
[6] http://astropark.hk.space.museum/
[7] http://hkspmobservatory.hk/iobs/
[8] http://www.hokoon.edu.hk/main.html
[9] http://www.noahsark.com.hk/eng/solar_tower.php

An App on Chemical Bonding

Dr. Man-Wai Maurice CHENG, Assistant Professor, The University of Hong Kong

Chemical bonding has been regarded as a central and fundamental idea in senior secondary chemistry. In the Hong Kong chemistry curriculum, the topic is usually taught at the beginning of Year 10. Learning of subsequent topics such as chemical reactions, energetics, kinetics, electrochemistry and organic reactions, and of biology subject (in food and nutrition) demand a sound understanding of chemical bonding. Nevertheless, research in science education over the past 15 years has extensively reported that students' learning of chemical bonding is problematic. The problem has become more notable in Hong Kong recently as students take a three-year chemistry curriculum. Local teachers have reported that the three-year course, especially those materials in the third year (i.e., Year 12), is very challenging to students. It is envisaged that not mastering the concepts of chemical bonding at the early stage of study would jeopardize subsequent chemistry learning. In short, ensuring quality learning of chemical bonding is essential and is a core to the learning of chemistry.

Science education literature has established two related factors that impeded learning:

(a) The topic is not well taught in school chemistry. For example, ionic bonding is often reduced to a 'transfer of electrons' while covalent bonding is often reduced to a 'sharing of electrons. The role of electrostatic force is played down unduly.

(b) The way that the topic is sequenced in official curriculums, and hence the contents of textbooks, are not conducive to meaningful learning of the topic.

My recent research has offered suggestions for the teaching of this topic. It is envisaged that a combination of the following focuses in teaching would enhance students learning quality:

(i) A focus on Coulombic electrostatics rather than the transfer and sharing of electrons;

(ii) The use of model-based approach of demonstration, i.e. chemical bonding is addressed in terms of Coulombic electrostatics, which in turn helps to explain and predict the properties of different materials. It contrasts with the current approach of chemical bonding as a description of structures of materials;

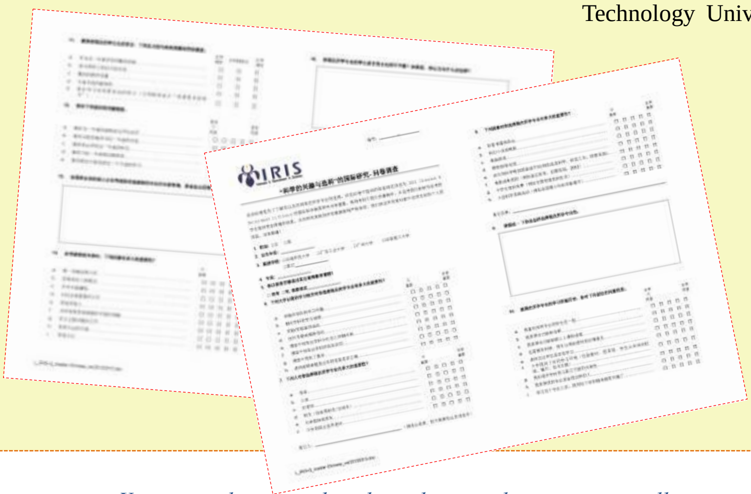
(iii) The focus on helping students to visualize bonding as a relationship (electrostatic force) rather than a process (electron transfer/sharing) and a structure (based on electron diagrams).

At the moment, I am developing a mobile device application (for iOs and Android platforms) that animates and simulates chemical bonding with the foci (i)-(iii) as stated above. The App has been tested with a group of chemistry teachers. The beta version will be available for free download by the end of October 2012.

Survey of Chinese learners in the International IRIS Study

Dr. Yau-yuen YEUNG, Department of Science and Environmental Studies, The Hong Kong Institute of Education, HONG KONG (Email: yyyeung@ied.edu.hk)

During the last decade, there have been some rapid and substantial changes or development in the socioeconomic background and the educational systems in Hong Kong, Mainland China and many places around the world and those changes will have significant impact on the future development of the science, technology and mathematics (STM) in higher education. Besides, students' interest in learning STM, other key factors influencing their study choices and the gender equity in higher STM education have been identified as the crucial issues that should be properly addressed by the policy-makers, curriculum planners and heads of higher education institutions so as to resolve any likely conflicts, unfairness, mismatch or unbalance between supply and demands in the manpower related to the STM disciplines. Echoing with those issues, an international comparative research project called Interests & Recruitment in Science (IRIS) has been launched by a team of researchers from 6 universities or institutions in five European Union countries. Basically, this project aims to help the improvement of recruitment, retention and gender equity patterns in STM education and careers. As a pilot study, researchers from the Hong Kong Institute of Education have developed the localized Simplified Chinese version of IRIS instrument (including the questionnaire plus a set of questions for the semi-structured interview of students) and administered the questionnaire survey to around 2,700 year-one undergraduate students in 23 different STM programs or majors in 3 large universities in Guangzhou, namely Guangdong Technology University, South China University and University of Guangzhou. About 5% of the students were interviewed. While the data processing is still ongoing, we also plan to administer the survey in Hong Kong and another city in Mainland China or Taiwan so that we will be able to make comprehensive comparison of findings amongst Chinese STM learners in different Greater China regions and with non-Chinese learners around the world.

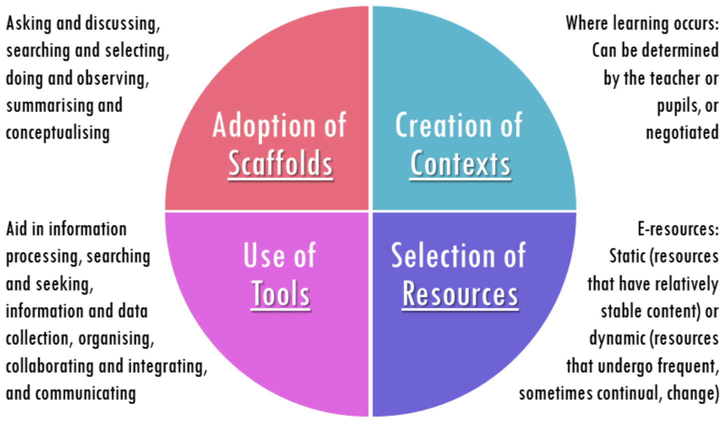


Online Resource-Based Inquiry Learning Environment: Effects of Teacher Pedagogical Practices on Science Understanding of Primary Learners Working in Groups

Prof. Wing-Mui Winnie SO, Prof. May-Hung May CHENG and Dr. Siu-Cheung KONG,
The Hong Kong Institute of Education, HONG KONG

Rapid advancements of information technology and the expansion of stable and high-speed Internet network have transformed the way teaching and learning take place and how learning materials are presented and delivered. Resources on the Internet are considered valuable to student learning if they are used at the right time for the right task. The project 'Online resource-based inquiry learning environment: Effects of teacher pedagogical practices on science understanding of primary learners working in groups' aimed at (1) exploring teachers' conceptions of inquiry learning with online resources, (2) identifying the types of classroom interactions associated with different pedagogical practices in inquiry learning and (3) investigating the effects of teacher pedagogical practices on learners' science understanding. Project outcomes had been presented at different of conferences and published in a number of journals.

A Resourced-Based e-Learning Environments (RBeLEs)1 was developed with data collected during the pilot study and with reference to a previous study done by the research team, which is a framework that helps teachers to plan their lesson with online resources in a more systematic manner. Participating teachers commented that the RBeLEs was useful for creating Internet resource-based lessons. The RBeLEs consists of four components—creation of contexts, selection of resources, use of tools and adoption of scaffolds.



One of the aims of this project was to explore teachers' conceptions of inquiry learning with online resources. Using an online survey, we found that although teachers' conceptions of inquiry learning seem to match well with those proposed by the literature in general, misconceptions exist and the level of perceived difficulties in implementing inquiry learning is high2. Moreover, teachers with a higher level of misconceptions of inquiry learning find implementing it more difficult. In addition, teachers who find implementing inquiry learning more difficult tend to place more emphasis on the importance of selection criteria for online resources and have more resistance to using them. Based on the findings, we suggested the following to be done: effective professional development programme to help teachers overcome misconceptions of inquiry learning, provide support for teachers in searching and using online resources, and enhance students' ICT literacy.

Another aim of this project was to identify the types of classroom interactions associated with different pedagogical practices in inquiry learning. The analysis of 27 lessons designed with the RBeLEs framework showed that lesson time spent on the six types of interaction—teacher instruction, teacher explanation, teacher-pupil interaction, pupil-pupil interaction, pupil-class interaction and individual work varied from lesson to lesson, indicating different pedagogical practices supported by online resources. A study of two classes also suggested that teachers can present the same topic (e.g. animal classification) using online resources in different ways—'deductive' or 'inductive'3.

The third aim of this project was to investigate the effects of teacher pedagogical practices on learners' science understanding. A study of three class of low, mixed and high academic level showed that pupil learning and the lesson designs with online resources are closely related, in particular the resources selected, the tools used and the scaffolds adopted4. To support student learning with online resources, we suggested using cognitively challenging tasks to promote thinking, group discussion to facilitate collaborative learning and appropriate resources to encourage engagement in learning.

Furthermore, we discovered from the content analysis of the lesson designs that teachers' selection and use of online resources and tools is mostly governed by their availability and hindered by students' limited ICT skills5. This study provided useful hints for teacher to select appropriate resources and perhaps diversify their selection as well as to consider the support needed by students to use certain online tools.

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"What's done to children, they will do to society." – Karl Menninger, Psychiatrist

The Impact of the Medium of Instruction on Students' Learning in Physics at the Senior Secondary Level in Hong Kong

Dr. Dennis Chun-Lok FUNG & Dr. Valerie Wing-Yan YIP
Faculty of Education, The University of Hong Kong

Introduction

Scientific language is an important means to construct scientific understanding and communicate this understanding to other people (Yore, Bisanz, & Hand, 2003). It is part of the fundamental sense of scientific literacy (Norris & Phillips, 2001), which includes the abilities of speaking-listening, writing-reading, representing-interpreting; and is crucial for students to acquire the derived sense of scientific literacy such as nature of science and scientific inquiry. Previous research (e.g. Isa and Maskill, 1982; Kawasaki, 2002; Lee, 2005) revealed that many languages, such as Chinese and Japanese, do not possess the vocabulary needed for abstract scientific concepts; and hence it is not surprising that English language learners, or the non-natives, would experience great challenges in learning science.

Studies over the years indicated that using Chinese –the native language in Hong Kong – had positive effects on students' motivation and achievement in learning science at grades 7 to 9 (e.g. Marsh & Hau, 2000; Yip, Tsang, & Cheung, 2003). On the other hand, a later study showed a discrepant result that students using English to learn science could still show greater interests in the subject (Yip, Coyle & Tsang, 2007). Since these studies were carried out for the junior high school, it is uncertain whether an advancement of scientific knowledge and English language proficiency among high school students would experience differences in academic performance and motivation to learn science. In particular, many Hong Kong schools which adopt Chinese for Medium of Instruction (MOI) in the junior years would shift to use English to teach their senior graders to maintain themselves as popular choices amongst parents. What will happen if the language of instruction changes from the native language to English when students progress from S3 (junior secondary) to S4 (senior secondary)? Will these students have poorer academic results and lower motivation to learn science than those who continue using Chinese? This study serves to understand if a similar pattern of poorer student achievement and lower motivation exists in learning senior secondary Physics.

Sample and design

A mixed-method approach was used to study three cohorts of grade 10 students of a high school from 2005-2007 (year 2005 = 65; year 2006 = 66; year 2007 = 68). They learned science in either Chinese (using Chinese as medium of instruction, CMI) or English (using English as medium of instruction, EMI); and they were further divided into high-, medium- and low-ability sub-groups in accordance with their ninth-grade internal school physics examination results (Table 1).

Table 1: Grouping of students in a year

	Students		
Ability / MOI	Low	Medium	High
EMI			
CMI			

The students learned about the units 'Heat' and 'Mechanics' by engaging in learning activities including project work, presentation and online discussion during the academic year. They used the 'designated' language during classroom interactions. Pre- and post-misconception tests, adapted from Force Concept Inventory (FCI) (Hestenes, Wells, & Swackhamer, 1992) and Thermal Concept Evaluation (TCE) (Yeo and Zadnik, 2001), were administered in both English and Chinese to understand the learning progress of the students. Inter-reliability checks showed that agreements for all the structural questions were above 80%. The Cronbach's alpha (α) for multiple-choice items was 0.83. At the same time, the students participated in a web-based forum. The aims of the forum were to provide an organisation for the students to carry on discussions and to realign themselves with other students as the need arose. By utilising the web-based forum, students and teachers created text and graphic notes, read and built onto each others' notes. The EMI and CMI students of different ability groups were interviewed at the end of the two units to discuss about the language-related difficulties they had experienced in the learning process, as well as their preference and motivation to learn in either language.

Findings and Conclusion

Due to the limited space, only part of the quantitative and qualitative analysis of the study is briefly reported in this article. Specifically, the results of the misconception tests generally revealed that at the senior secondary level, learning science in English exerted a positive influence on the performance of the high-ability students. Little conclusive evidence regarding the middle ability groups was found. The low-ability students might benefit from using Chinese in a certain unit (e.g. mechanics), while the language might not facilitate their learning significantly in another unit (e.g. heat). The interview excerpts of several students might provide possible explanation to the insignificant difference in the performance of low-achievers and medium- / high-achievers of this unit.

> 'I think it was very difficult for me to learn the topic of "Heat" through using English. Since this topic is language-based, and we were not used to the English textbook for studying science. We spent ages checking each word before lessons. However, the English words in "Mechanics" were easier. ' (Cherry, EMI, Low-Ability Group, 2005)

> 'In general, it was more difficult for us to use Chinese keywords to search for information on the Internet regarding the concepts and principles of [science]. We needed to use English keywords to search for resources and then translate some websites into Chinese for reference.' (Jenny, CMI, Low-Ability, 2005)

This result is in line with previous findings (e.g. Isa & Maskill, 1982; Kawaski, 2002) that many languages, including Chinese, do not possess the precise vocabulary required to describe abstract concepts. Therefore, we suggest that teachers have to be supported in raising their awareness about the language use – no matter in English or Chinese – to explain the abstract concepts behind the keywords in science.

見賢思齊焉，見不賢而內自省也。(論語)

Concerning about the effect of MOI on the motivation to learn Physics at the senior secondary level, the use of English exerted a negative influence on the low-ability group. For example,

> 'It was easier for me to feel bored when I read the textbook in English. Sometimes I even gave up reading the textbooks and just read the teacher's notes for quizzes, tests and examinations.' (Steven, EMI, Low-Ability Group, 2006)

On the other hand, the more proficient English language learners felt that using English in the lessons could benefit them to improve their general English.

> 'I think I did gradually improve my general English standard. However, it was not always the case for every student. I also noted that there were some classmates who failed to cope with the difficulty in learning physics using English. Some classmates were adversely affected.' (John, EMI, High-Ability Group, 2006)

> 'I felt good studying [physics] using English. I think science should be studied in English because the world is using English for knowledge communication, especially in science. Western countries are dominating the advance of science; so we can only learn the latest development of science by using English.' (Benson, EMI, High-Ability Group, 2007)

The more capable students were, more preference was shown to the use of English; and in many cases, their reasons were very pragmatic. Our study on the impacts of MOI on the achievement and motivation to learn Physics varied between groups of senior secondary students with different abilities in science. The performance of students also diversified from learning one unit to another because of the language demand in different topics. A uniform pattern shown in previous studies at the junior level did not exist. Further studies can explore the factors that contribute to such variations, and how various learning support would be appropriate for students with different language needs.

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Well-being and Environmental Project

Dr. Nga-Yee Irene CHENG, Dr. Man-Yee Emmy WONG & Prof. Wing-Mui Winnie SO, The Hong Kong Institute of Education, HONG KONG

Nowadays, the general public has become more aware of the well-being and environmental problems related to our natural world, healthy life and our environment."Well-being and Environmental Project" was therefore developed by The Hong Kong Institute of Education to increase students' awareness and develop a better understanding towards these three areas. By providing services to all primary 5 students in 3 project schools, this project had facilitated a two-way flow of academic knowledge between Institute and the school community.

A Three-tiered programme was developed in this project. Through experiencing the fun and joy of a half-day programme, with games and talk , students knew more about the concepts related to the themes of natural world, healthy life and our environment. They had also expressed their viewpoints and opinions towards daily issues in these areas .For the teachers, through meetings, observing the programme and sharing with project investigators, they had also acquired lots of useful information and knowledge related to the topics of wellbeing and environment. Sets of leaflet and booklet copies were also sent to schools for teachers' reference in lesson preparation and teaching. For the parents, we had also developed resource booklet to provide them with useful information to facilitate home education in these areas.

Student work : Poster design

Other useful web learning resources, basing on the display and talk materials, and leaflet information, were also developed. Moreover, the project had encouraged students to integrate their perspectives and ideas in their poster designs in the areas of well-being and environment in daily life. On the other hand, through this project, we have built up a connection with the students. We hope that after the students had learnt those new perspectives, they can extend what they had learnt to their family members, friends or even, to the community.

Student work : Poster design

Eight GS teachers, 296 students and their families were involved in this project. Students were generally able to capture the major concepts and facts relating to the 6 themes. They are communicable diseases, Obesity, carbon emissions, noise pollution, light pollution and bacterial food poisoning which integrated information about natural world, health and environment. Teachers and students showed very positive attitudes towards the way of knowledge transfer adopted in this project. Students were happy to share the knowledge they had learnt with the project team during the debriefing session and with their family members.

To conclude, although this is a small-scale project, a good start has been instigated. Through cooperation between the Institute, school teachers and parents, we had achieved the goal of enhancing student's level of understanding in areas related to their wellbeing and environment and lots of resources have also been developed for home education.

Call for Papers: Science in Society Conference, Berkeley, USA from 15 - 17 November 2012

The International Advisory Board is pleased to announce the Call for Papers for the Fourth International Conference on Science in Society and the Call for Submissions to the peer-reviewed The International Journal of Science in Society.

This year's Science in Society Conference will take place at the University of California, Berkeley. Scientific study in Berkeley has long had impacts on society, making it the perfect venue for the Fourth International Conference on Science in Society. This year's conference will feature a special plenary presentation by Senior Advisor, Paul Lombardo and Associate Director, Kayte Spector-Bagdady from the Presidential Commission for the Study of Bioethical Issues. For more details, please visit: http://science-society.com/conference-2012/ .

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Proposals for paper presentations, workshops, round tables or colloquia are invited, addressing science through one of the following themes:

* Theme 1: The Values and Politics of Science
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* Theme 3: The Knowledge Systems and Pedagogies of Science

The deadline for the next round of Call for Papers is 12 October 2012. For full details on proposal submission and conference registration deadlines, please visit the conference website at: http://science-society.com/conference-2012/call-for-papers/ .

Presenters may also choose to submit written papers for publication in the fully refereed The International Journal of Science in Society. If you are unable to attend the conference in person, virtual registrations also include submission to the journal for refereeing and possible publication, as well as access to the journal.

"When you have to cope with a lot of problems, you're either going to sink or you're going to swim." – Tom Cruise, Actor

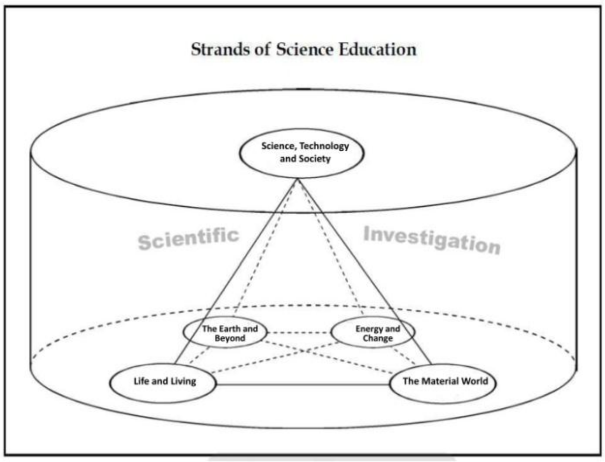
A Brief Review of the New Senior Science Curriculum of Hong Kong

Dr. Lee Yeung Chung, Department of Science and Environmental Studies, The Hong Kong Institute of Education, HONG KONG

With the restructuring of the senior secondary education system in Hong Kong in 2009, the senior secondary curriculum was overhauled substantially by the conversion of the 2-year Certificate Level and the 2-year Advanced Level to a new 3-year senior secondary level to prepare students for the Hong Kong Diploma of Secondary Education (HKDSE). The new system requires students to study four core subjects, namely English Language, Chinese Language, Mathematics, and Liberal Studies which is a newly developed subject aimed at fostering students' critical thinking and value judgment. In addition, students can also choose one to three elective subjects from a wide range of academic or career-oriented subjects. This new curriculum structure implies ceasing to group students into Arts or Science streams that has been practiced for decades. As a result, a reform of the traditional science subjects, namely Physics, Chemistry and Biology became necessary and desirable.

The recent science curriculum reform led by the restructuring of the education system was regarded as a golden opportunity to review the type of science education provided to students in Hong Kong. The primary concern is to make the new curriculum more flexible and tailor to the needs of students with mixed abilities and varied interests, and to respond to new developments in the emphases of science education worldwide. The three single science subjects covering the traditional disciplines of biology, physics and chemistry have been revised to fit into a three-year study, which means that the old Advanced Level subjects had to be trimmed to match with the reduced curriculum time. These three subjects are now pitched at a level that is considered as equivalent to the Advanced Supplementary Level under the British system. Apart from the essential changes to the curriculum contents in terms of quantity, each subject was considerably updated with the addition of more advanced topics such as biotechnology, applied microbiology, medical physics and material chemistry to reflect the development of scientific knowledge in contemporary society. In order to cater for the diverse needs and interests of students, each subject now includes an elective part in addition to the compulsory part. In the elective part, the school has a choice of two elective topics out of a total of four.

To allow students to have a greater flexibility in choosing elective subjects and to attract students to study at least some science in this curriculum component, three new combined science subjects, namely Physics-Chemistry, Physics-Biology, and Biology-Chemistry were developed in addition to the single subjects by merging the three science subjects in different combinations. Each of these combined subjects is made up of the compulsory part of the two related science subjects, leaving out their elective parts. Apart from Combined Science, a new subject - Integrated Science – has also been developed by integrating the contents of the three single science subjects. This new science subject adopts an interdisciplinary approach underpinned by such unified concepts as systems, models, change, and form and function, and by the nature of science which include scientific thinking, scientific attitudes and scientific community. The curriculum contents are made up of interdisciplinary themes such as *Water for Living*, *Keeping Ourselves Healthy*, and *Balance in Nature* that traverse the traditional boundary of physics, chemistry and biology.



Apart from reforming the curriculum contents, the new science curricula also put more emphasis on scientific inquiry, the inter-relationships among science, technology, society, and environment, and the nature and history of science in order to better develop students' procedural knowledge, understanding of contemporary socio-scientific issues, and commitment to be responsible citizens who are scientifically literate.

Despite the good intentions of the curriculum planners, curriculum reform of this scale is highly complex and challenging. Not only does it involve administrative and logistics support such as new timetabling arrangement and the acquisition of laboratory appliances for new practical activities, it also entails on-going induction of both novice and experienced science teachers for the acquisition of new content knowledge and pedagogies so as to put the new emphases into practice. Teachers have pointed out several problems or limitations of the intended curriculum such as insufficient curriculum time, and big class size. The most overwhelming issue is that teachers now have to teach students that are more mixed than previously in terms of students' ability to study science. This is because compared with the previous Advanced Level students, the new student cohorts are more mixed in ability as they will not have gone through the screening process made possible by the old Hong Kong Certificate Examination which served as a barrier to the less academically inclined students to proceed to the Advanced Level. Exacerbating this situation is the increased flexibility for students to choose electives, which implies that students need not choose all the three science subjects as their electives. A corollary is that students who choose to study only one science subject will lack the background knowledge provided by the other science disciplines. An example is that students who choose biology but not chemistry may lack a basic understanding of the atomic theory, which will to a certain extent hinder their understanding of the biochemical reactions taking place inside the body.

An even more controversial issue is the inclusion of school-based assessment as a means of assessing students' ability of conducting scientific inquiry that will contribute to the final grade in the new HKDSE. This assessment mode was originally intended to broaden the learning outcomes to be assessed including students' ability to perform scientific inquiry, as well as other more generic abilities such project-based learning, and probably other more creative works. It also aims to relieve students of the psychological pressure caused by a one-off public examination after the three years' study. However, this practice has met with rather strong opposition from the teachers due to the large class size and the difficulty to ensure reliability in the assessment process. As a result, the school-based assessment has been reduced in scale, including only minimal experimental activities to be assessed by school teachers.

In conclusion, the new science curriculum framework implemented has provided a very good opportunity to review the old curriculum so as to align the contents with recent trends of science education, to allow a greater flexibility for subject selection based on students' interest and ability, and to improve the validity of assessment. However, there are problems arising from these changes such as the need for teachers to teach students from a wider range of abilities and backgrounds, and to assess their abilities with reasonable reliability and validity. Insufficient curriculum time has become an increasingly important issue as the resolution of these problems is exceedingly time-consuming, and the greater the problem of student diversity that the teacher faces, the greater amount of curriculum time will be needed by the teacher to implement the curriculum to achieve the intended learning outcomes to a reasonable degree. These problems should be dealt with by the curriculum planners in the near future lest teachers may incline to become examination-oriented in order to channel maximal resources to achieve the most 'observable' outcome at the expense of other valuable goals.

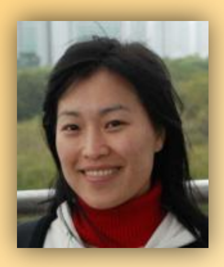
References**:**

The new science curricula of Hong Kong can be accessed at the following website: http://334.edb.hkedcity.net/EN/curriculum.php

Report of Dry and Wet Waste Separation Pilot Programme in the Hong Kong Institute of Education

Dr. Wenjing DENG & Prof. Wing-Mui Winnie SO,

Department of Science and Environmental Studies, The Hong Kong Institute of Education, Hong Kong



1. Introduction

According to the statistics from Hong Kong Environmental Protection Department (HKEPD, 2010), the total quantity of average daily disposed municipal solid waste at the remaining three strategic landfills in Hong Kong is 9,114 tons, 40.2% of which is the putrescible, also called wet wastes or organic waste. And the dry waste is recyclable waste other than wet waste, such as paper, old clothes, plastics, metal can, and so on. If dry and wet waste is not sorted out, the recyclables from dry waste will be contaminated by wet waste and eventually turns to unrecyclable. Therefore, dry and wet waste separation is so important as to reduce the increasing pressing problem of landfills. From 2003 to 2004, a pilot programme has been launched on dry and wet waste separation of domestic waste by Hong Kong government. As is shown in the report of the pilot programme, only 20-25% of participants and lack of financial support lead to the low success rate. Due to the continuing concern of dry and wet waste segregation, our programme to improve students' awareness of dry and wet waste separation in Hong Kong Institute of Education was decided to be conducted from January to June 2012. University students, as considered, sharing the comparatively similar educational level and achieving higher cultural level, may have higher environmental awareness. The estimated participation rate is higher and we can collect more ideas from the research applied among them. This project aims to investigate how much dry and wet waste is generated in HKIEd, and to compare the result before and after we disseminate the waste separation knowledge. In addition, obstacles of dry and wet waste separation were found.

2. Methods and process

The first period of data collection of the proportion of dry and wet waste in the total waste that generated at every floor in three hostels was from March 1 to March 31, 2012. The data were collected once at the same time every day during that period. Data collection included hand-delivered questionnaires and records of daily total quantity of solid waste generated in student hostels. Dissemination of dry and wet waste separation was made by posters and guest lecture. In April, 390 questionnaires were valid. This survey instructed comprised several areas: 1) personal particulars, 2) awareness of dry and wet waste, 3) attitudes towards the dry and wet waste separation pilot programme set in HKIEd. In the meantime the promotion of dry and wet waste separation was also going on from April to May. Posters with concepts and samples of dry and wet waste and procedures of dry and wet waste separation were designed and put up all around the campus. After the promotion period, the pilot programme was launched for a month (s from May 1 to May 31 2012). New rubbish bins for collecting dry waste were prepared to be put aside the original rubbish bins in the hostels. And instruction sheets were placed near the rubbish bins. That was the second period of recording work of daily disposed solid waste in the student hostel.

The mixed waste

The wet waste after separation

The dry waste after separation

3. Result and Discussion

According to the survey, a considerable proportion of participants have certain knowledge about environment, but more propaganda and education need to be done. The result of our questionnaire shows that about 65.5% of our respondents have not heard of the concepts of dry and wet waste. Only 27.4% of all the respondents can clearly distinguish dry and wet waste when they were asked to pick out all the wet waste from various types of waste in the questionnaire. The dissemination of dry and wet waste seems not prevalent.

After our promotion, in the light of the result of waste separation, nearly all of the waste dumped in the recycling bins is dry waste, except a tiny box of candy. That shows students can distinguish dry and wet waste in practice after promotion.

Most of the students participated in the survey show a positive attitude towards the separation programme. Most of the respondents (91.2%) recognize the importance of dry and wet waste separation, and 73.0% of all claim that they are willing to support the separation by action (Fig. 1).

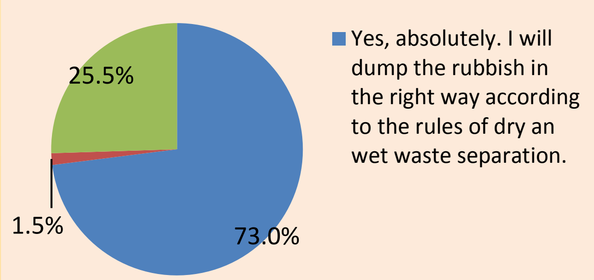


Fig. 1 Willingness to participate in the dry and wet waste separation pilot programme conducted in HKIEd?

However, in fact, the separation rate is not very high. According to our record of the separation rate in the hostels, which is showed in Fig. 2, only 52.2% of dry waste has been dumped into the recycling bins, and the rest of dry waste mixed with wet waste cannot be recycled any more.

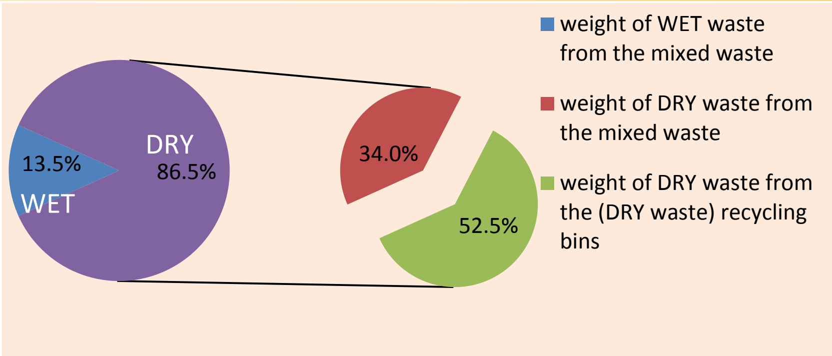


Fig. 2 The percentages of weight of total DRY waste and the separated DRY waste of total waste generated from HKIEd student hostels

Students are more likely to support the separation programme at the beginning, but some of them fail to do so due to some realistic obstacles. The question to explore those factors is also included in the questionnaire. The major participants consider the biggest obstacle is that they don't know the principle of classification. The reason ranked second for low efficiency of waste separation is wasting time. A few students (1.5%) take the dry and wet waste separation as a meaningless issue. (Fig.3)

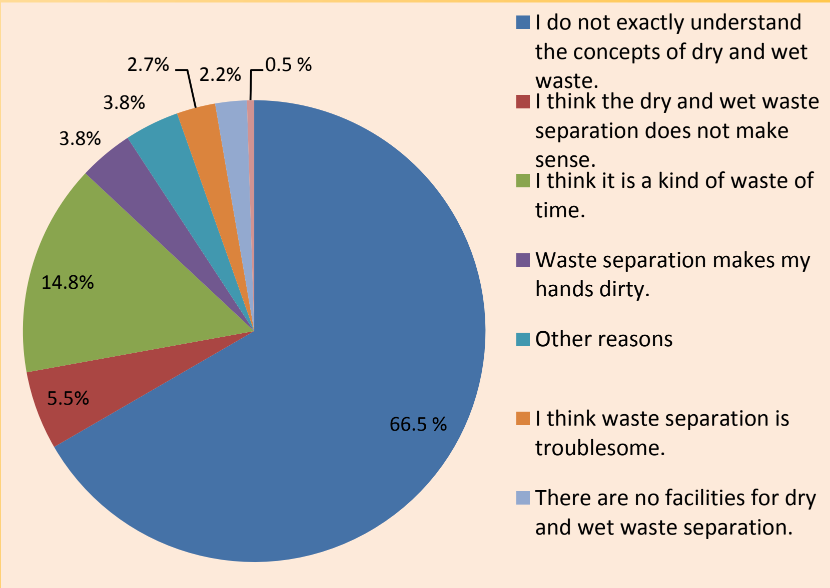


Fig.3 Factors lead you not to follow the rules of dry and wet waste separation?

4. Conclusion

On the basis of the research result and the obstacles of waste separation that are revealed in this programme, a majority of students are willing to support this kind of separation. Nevertheless, their actions are all limited by several of obstacles: inefficient promotion and education of waste separation knowledge, insufficient financial and manpower support for running this programme, and lack of a complete waste separation and management system. Dry and wet waste separation is of great significance in terms of not only sustainable environmental development but sustainable economic development. There is still a long way for developing a dry and wet waste separation system in Hong Kong.

5. Acknowledgement

This study is supported by Knowledge Transfer of Faculty of Arts and Science (renamed Faculty of Humanity and Social Sciences), Hong Kong Institute of Education (HKIEd). The authors of this paper is grateful to Professor Zhou Lixiang from Nanjing Agricultural University, Mr Chan Wing Lai, the Vice President of Hong Kong WEEE Recycling Association and Dr. Fok Lincoln from HKIEd, for their accepting the invitation to be the guest lecturers in the lecture on dry and wet waste separation dissemination. The authors also would like to thank all persons who assisted in administering surveys. Appreciation goes to all HKIEd students who participated in the survey and the lecture talks.

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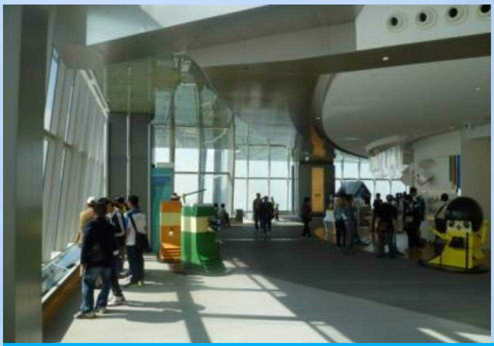
Let's Learn In The Sky

Dr. Kwok-Ho TSOI, The Hong Kong Institute of Education, HONG KONG

Environmental education is a learning process to promote the knowledge background of learners about the environment and their environmental awareness. A genuine field-based learning strategy is an effective approach that not only links up the theory and practices in real life contexts, but also makes the learning process more interesting and stimulating. We have initiated a collaborative project with an international commercial sector to develop a teaching programme for primary school children on the basis of this learning approach.



A corner of the deck.

International Commerce Centre (ICC), Picture from http://travel.sina.com.hk/

Sky100 features a 360° observation deck on the 100th floor of the fourth highest building in the world, International Commercial Centre (ICC). The observation deck is a unique field study site that provides a special but excellent learning platform for the children to study environmental issues from the aerial view of the city. We aim to infuse the authentic field-based learning experiences in such a breathtaking height (393m above sea level) into the curriculum of a primary subject General Studies (GS). A series of course have been developed for the teaching programme under two main themes. Courses of 'Hong Kong weather', 'Green environment and natural habitat of HK', 'Sustainable city and landscape development in HK' were proposed in the theme of science. Courses of 'Living and traveling in HK', 'Cultural diversity of HK' and 'HK history' were developed in the social or humanity theme. Contents of science, cultural and social domains in the GS subject have been embedded in the teaching plans and learning activities of these courses. We expect to enhance children's understanding of the environment and generic abilities such as problem solving skills, scientific inquiry methods and collaboration skills through the courses. The first draft of all course materials and plans has been completed. Our next step is to run the pilot trials. We have also prepared developmental workshops for the course instructors to assure the teaching quality.

An aerial view of the city.

This project is supported by a professional team with members specialized in various disciplines, including environmental and natural science, science education, civic education, anthropology and humanity. The team also comprises a group of in-service primary school teachers and student teachers. We all join hands together to strive for a better Hong Kong for our children.

Our team members are introducing a proposed course.

読書は學問の術なり、學問は事をなすの術なり一福沢諭吉

Japan

What is the Sustainable Development for the Japanese Female Students?

Prof. Shiho MIYAKE, School of Human Sciences, Kobe College, Japan

Kobe College, Japan, is one of the oldest higher education facilities established in 1875. I have worked here for four years. In this article, I would like to introduce you a part of my research study about the female students' image of sustainable development (SD).

Figure1. A Shampoo Refill

The United Nations Decade of Education for Sustainable Development began in 2005. Education for Sustainable Development (ESD) is now a fundamental slogan of citizenship education for the young generations beyond curriculum and subjects. Especially, three dimensions such as socio-cultural, environmental and economic are keys between ESD and other 'adjectival' educations (UNESCO, 2009). Which of the issues associated with these dimensions is strongly linked to students' images of SD? The author started to investigate SD images among Kobe College students using the word association method and photograph collection in 2010.

Figure2. My Chopsticks

In 2010, 37 students answered in 5 minutes to the word association questionnaire after a semester of lectures related to environmental and human activities. A question key phrase is 'Sustainable development is'. Moreover, during a semester of lectures, students took photographs when they found a SD related items. Photographs may show a students' belief for SD. As a result, 1097 words were collected by the word association questionnaire. Best representative SD image words are 'Recycle', 'My' items and 'Eco' issues. Based on photographs, it was found that students tend to avoid use of disposable items and to take environment-friendly action. For example, photographs of a shampoo refill (Figure 1) and 'my chopsticks' (Figure 2) were taken by the students. As eco related issues, an eco-bag and a light-weight pet bottle (Figure 3) were showed.

Figure3. A light-weight Pet Bottle

The result of this survey reveals that Japanese female students tend to be most interested in the environmental among of the three dimensions. They apparently do not discern concrete images related to the socio-cultural dimension and the economic dimension like human rights, medical issues, or social systems. We need to continue this research to understand how best to develop an educational policy and content that reflect the balance among these three dimensions. The Japanese version of this article is available at http://ci.nii.ac.jp/naid/110008791410.

References: UNESCO (2009) *Review of Contexts and Structure for Education for Sustainable Development 2009.*

Nepal

The Transformative Education Research Group (TERG)

The Transformative Education Research Group (TERG) at Kathmandu University organised a one-day international symposium on transformative education research on the 30th of July, 2012. The symposium was attended by more than 100 students and faculty members of the School of Education. Dr. Peter Charles Taylor, Director of Transformative Education Research Group at Curtin University, addressed the symposium as a plenary speaker highlighting key issues associated with transformative education research, such as sustainable development, transformative learning and multi-paradigmatic education research. Dr. Taylor emphasised the need for developing postgraduate research programs in accordance with research as/for professional development. The second plenary speaker, Dr. Bal Chandra Luitel, Associate Professor and creator of the Transformative Education Research Group at Kathmandu University, highlighted key facets of spiritual knowing as an important component of transformative education research.

South Korea

Cultivating Global Citizens with Scientific Literacy for the 21st Century: World Class University Project at Ewha Womans University

Prof. Hyunju Lee, Global Institute for STS Education, Ewha Womans University, Seoul, South Korea

World Class University (WCU) project, supported by Korean Ministry of Education, Science, and Technology, is designed to cultivate academic excellence and competitive power of Korean universities. Science educators at Ewha Womans University have been conducting 5-year WCU project, entitled to "Establishment of Education System for Enhancing Scientific Literacy for 21st Century," and we have just finished the 4th year. In the 1st and 2nd years, we proposed a new conceptual framework for the 21st century scientific literacy. This framework emphasized developing character and values as active and responsible citizens of a global community and meta-cognition skills as life-long learners, as well as understanding of core science ideas and intellectual capabilities to solve local, society and global problems. We identified five major dimensions (i.e. core ideas of science, habits of mind, character and values, science as a human endeavor, and meta-cognition and self-direction) and key elements under each dimension (see Choi et al., 2011).

Based on our conceptual framework, in the 3rd and 4th year, we have developed the *21st century Scientific Literacy Education Program (21st SLEP)* which can be used for educating secondary school students, college students, and science teachers as global citizens. And we have digitalized the 21st SLEP into web-version of curriculum materials in order to share and distribute our program (it will be available on the web soon). As an initial step for the development of 21st SLEP, we identified 10 essential scientific issues required to global citizens in the 21st century. The issues include climate change, environmental issues, natural disasters, biotechnology, health, development of space, development of new materials, depletion of natural resources, development of renewable energy, and information science.

Like in the PISA framework (OECD, 2007), we agreed that student engagement in a variety of situations would be essential: 1) in personal contexts (issues about themselves, family, or acquaintances), 2) in societal contexts (issues of their local communities or countries), and 3) in global contexts (issues of global nature). For instance, for the issue of climate change, students as future citizens, at a personal context, need to understand how climate change affects their everyday lifestyle such as concerning food, clothing, and housing. In addition, at a global context, students should understand environmental consequences of global warming for the planet and its social impacts, and be aware of the importance of international cooperation needed to tackle the issues.

We have been implementing 21st SLEP for secondary students and observing some positive effects on promoting scientific literacy as global citizens. For instance, in the 4th year we implemented the biotechnology unit from 21st SLEP for 9th grade students. We found statistically significant improvement in enhancing their communication skills (e.g. understanding of others' main points, respect to others' perspectives, active assertion) and character and values as global citizens (e.g. ecological worldview, socioscientific accountability, and social and moral compassion). We are sure that 21st SLEP will be interesting to EASE members as a new approach to science teaching. The 5th year of the project has just started. We cordially invite EASE members to collaborate with us to promote global scientific literacy of our students, teachers, and other individuals living in the 21st century society.

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"Opportunity is missed by most people because it is dressed in overalls and looks like work." —Thomas Edison, Inventor

EASE Summer School 2012

The 2012 EASE Summer School hold in Beijing Normal University, China Mainland on 19-25 August, 2012. There are 27 Ph.D. students, 5 coaches and 10 professors from five east-Asian regions participating in this activity, with the purpose of sharing researches of science education and strengthening the collaboration in various fields of science education across these five regions. The following are the sharing from the students.

Fruitful, Unforgettable and Enjoyable Experience

Participating in EASE summer school was a fruitful experience. I had ample opportunities to take part in academic exchange. Through attending lectures conducted by professors, I gained more understanding about science education in different East-Asian regions and recognized various innovative methodological designs in educational research. In group discussion sessions, each group member presented his/her own doctorial proposal in turn. I presented my proposal to the professors (Prof. Chin Chi-chin & Prof. Liu En-shan), the coach (Dr. Jho Hun-koog) and my group members as well. I was glad to have many critical but constructive comments from Prof. Chin, Prof. Liu, Dr. Jho and my group members. Their comments were extremely helpful in shaping up my research study and improving my research skills. I also learnt from my group members. Some of my group members had research studies in the field similar as mine, we shared our knowledge and viewpoints about the field with each other. Other group members had research studies in the fields totally different from mine, I gained knowledge about their research fields and got inspirations from their presentations. The fruitful discussion not only broadened my horizons in science education, but also let me appreciate different viewpoints on the same subject. We all learnt respecting and accepting others' opinions in the discussion process.

The most unforgettable event in the summer school should be the collaborative research proposal preparation sessions. Before the sessions, I was a little bit doubtful if we could plan a collaborative research proposal within such a short period of time (less than 2 days!). With the support from Prof. Chin, Prof. Liu and Dr. Jho, and active participation of our group members, we did it! During the sessions, everyone of us made use of our expertise and contributed to different parts of the proposal. We worked hard on information search, literature review, and research methodology development, etc. We exchanged knowledge and ideas with each other. Prof. Chin, Prof. Liu and Dr. Jho continuously gave us many valuable advices and comments on our work. We learnt a lot from the process! On the day before the collaborative proposal presentation, we worked until 5:00 a.m. Though all of us were very tired of the cultural visit in daytime, we valued this collaborative work very much and tried our very best to accomplish the task together. Dr. Jho did not sleep as well. He gave many constructive advices on our work and provided spiritual support throughout the process. At the end, our proposal got a second prize! It was the most rewarding moment. We started to think that our efforts got returns. We all were very delighted and forgot all the weary experience in the proposal preparation process!

I also had an enjoyable experience in the summer school. Despite of the tight schedule in the summer school, I joined other participants and went sightseeing with them after the school activities. We visited Wang-Fu-Jing Street, Olympic Garden and Tian-An-Men square and tried various delicious traditional Beijing dishes together! Late at night, we gathered and chatted in our apartment room. Everyone of us willingly shared the culture of our own regions including historical contexts, beliefs, customs and foods, etc. with others. The sharing was interesting and meaningful. I gained more understanding of the cultures of different regions. Through sightseeing activities and cultural sharing, I also developed friendship with other participants! I remembered that on the last day of the summer school, we exchanged our contact and reluctantly said goodbye to each other.

We had a cultural visit to Forbidden City and Temple of Heaven. Both of them were magnificent historical architectures. Introduction of the places by the local Chinese participants deepened my understanding about the historical backgrounds and the purposes of these architectures. It was a valuable learning experience!

I must say thank to all professors, coaches, participants and supporting staff. Without their support and active participation, I would not have such fruitful, unforgettable and enjoyable times in EASE 2012 Summer School in Beijing!

Vivian Man, The University of Hong Kong, Hong Kong

"A child is not a vase to be filled, but a fire to be lit." —François Rabelais, Writer

EASE 2012 Summer School Reflection

I have to say that it is indeed a wonderful, unforgettable experience for me to participate in this EASE summer school. I really appreciate that the EASE summer school has created such effective platform for us to share opinions and to be friends with each other.

This EASE summer school has four parts. The first part is a series of lectures given by professors from different regions. The lecture titled "The Road We Walk-From A Colony To An Island" impressed me very much. The second part is group discussion, during which each group member was required to make a brief presentation about his/her research work. I was glad to have many critical but constructive comments from Prof. Lien (Taiwan), Prof. Lu (Taiwan), coach Takamatsu (Japan) and my group members. Their comments facilitated me to reflect deeper on my research. Plus, their comments and suggestions helped to shape up my further research study. I also learnt from my group members. Collaborative work is the third part, which is also the most challenging part for us during this summer school (less than two days). However, I really think it is worthwhile to have such collaborative work. Through the process of collaborative work, we gradually learned how to negotiate and cooperate with each other, especially when we started with different premises, held different key beliefs, understandings, or values. Last part, we went sightseeing. The tight schedule in the summer school, virtually, could not reduce our enthusiasm and passion to enjoy the beautiful scenery and culture of Beijing, such as Wang-Fu-Jing Street, and the delicious Beijing food, such as Beijing Duck. What an unforgettable experience!

More importantly, I think, this EASE summer school has built a kind of invisible bridge, which enables us to communicate or to cooperate in the future. The friendship built during these five days would facilitate us to have further communication during our future academic career, which may lead further cooperation and achievement.

Finally, I must express my sincere thanks to the organizers of the EASE summer school, all professors, coaches, participants and supporting staff. Thanks for their support and active participation. Without all of you, I would not have such wonderful time in Beijing.

CHEN Yu, The Hong Kong Institute of Education, Hong Kong

A chance for meaningful learning through experience and reflection

As a novice Phd student struggling with my own Phd project, I was lucky enough to have attended the 2012 EASE Summer School. John Dewey argues that learning occurs through experience and reflection. I will illustrate how the summer school afforded me the opportunities to 'experience' and 'reflect', and hence fostered my meaningful learning.

Experience was mainly of three types (1) attending instructive lectures by renowned scholars in the field of science education, (2) engaging in fruitful group discussion among budding science education researchers and (3) paying a visit to a local middle school. The lectures by Professors centred on contemporary issues in science education such as nature of science, student motivation, inquiry-based instruction, assessments and etc. These informative talks not only broadened our understanding on important concepts in the science education literature, but they also revealed new insights. Group discussion was of two types: dissertation report discussion and collaborative proposal discussion. Despite the different formats, the coaches and professors of my group orchestrated meaningful discourse among the group members. In the dissertation report discussion, the group members acted as critical friends and challenged one another to explicate their thoughts and the logics behind the designs of their study. Though our group members were at different stages of our research trajectory, our views on the criteria of a good science education research design converged. Through immersion in the discussion, we absorbed constructive feedback and suggestions to polish our own studies. In the collaborative group discussion exercise, we engaged in a community of practice to work for a common goal: to devise a research proposal for presentation. Differing in the cultural background and perspectives, we did diverge in our views at times. Nevertheless, disagreements were resolved and settled by meaningful debate among members. By partaking in collaboration with peers, we learnt how to negotiate with others in order to reach a mutual consensus. Last but not least, we also visited a middle school in China. We were ushered to different science laboratories which were well equipped with state-of-the-art facilities. We also got chance to interact with local high school students to better understand their learning experiences in the local education system.

My dear friends in the EASE Summer School

The experience in the summer school forged my critical reflection. Given the insightful comments and feedback from my peers, coach and professors, I was forced to think of ways to brush up my own Phd project, especially on how to convince others of the significance of my project. Exposed to the culturally diverse views, I was reminded of the need to be more open to different viewpoints, particularly to be more accepting to others' views in order to learn from others.

In all, the meaningful experience offered by the EASE summer school platform coupled with my thoughtful reflection enriched my professional knowledge, skill and attitude for carrying out high-quality science education research. Apart from my growth in scholarship in conducting research, a rather unexpected learning outcome was my deeper understanding of the unique culture of the Beijing city, including its food, its place and its people. Though the summer school has ended officially, I believe the friendship developed will continue to last. I hope I will have a chance to meet and collaborate with my buddies again in the near future.

Kennedy Chan, The University of Hong Kong, Hong Kong

EASE 2012 Summer School Reflection

Autumn is the best season in Beijing, we came to Beijing in the best season to participate the EASE School. As the fourth-year EDd student, I didn't anticipate too much before I came to Beijing. I had imaged that it may be something like that I just need to sit there quietly and take some notes on my notebook. However, this opinion has been overturned rapidly from the beginning of the Summer School.

We got a big warm welcome from the organizers not only from the local students but also the professors and tutors. During the summer, we not only developed friendships with other doctoral students from different areas but also got the help and advices from celebrated science educators. It's amazing and wonderful.

According to the planning of the summer school, there are the some seminars given by professors from different areas of East Asian, and doctoral students should present their personal proposal and we also should finish and present a proposal cross five areas based on collaboration with team members. The lectures given by professors are enlightened and broaden our eyesight. We also feel so lucky to hear so many wonderful lessons in such short time.

The second part is to present personal proposals. During this secession, each doctoral student needed to present their personal thesis proposal and provide the feedback to the team members' research. At the same time, the professor and tutor of each team provided their advice to the proposal. It's very helpful, especially to me, for I am struggling with my thesis. These advices become a shining key which open the door of my further work. The others' proposals become a mirror led my reflection. The learning process is excellent.

The most impressive part is to make a cross area research proposal. According to the planning, we should finish a research proposal in two days. You may think we are crazy. Yes, to finish a proposal in two days and present it in the summer school. The preparation of proposal is pain but joyful. We are five doctoral students who have different background and speak in different languages. English is our only common language to communicate, although our English is not so fluent, it did not obstruct our communication. For we all love science and science education, it's our common ideal.

To determine the research question was not so difficult, in order to challenge ourselves, we determined to pick a new topic which differs from our past research studies as our research content. We soon determined to research the science teachers' perceptions and the influence by different cultures. But to persist and carry out the questions is too difficult. We had to find a way how to definite culture and to find an approach to evaluate the culture. Culture is a very familiar and broad word to us and we do not know how to capture it. If without the strong endorsement of our tutor and professor, Dr. Wangjian and Prof. Tuan, we may have given up this direction several times. In order to find a way to evaluate culture, we referred many research studies which we seldom got involved before. In the last two hours before the presentation, we solved the problem and finished the PPT. At that time, we have worked two days almost without sleep. But we felt very happy.

All good things must come to an end. Although the summer school just lasted for one week, the friendships have been built, and the fruitful learning outcomes has been achieved. At last, I'd like to say, I feel so lucky to join the summer school in Beijing. I enjoy it.

XIE Qun, The Hong Kong Institute of Education, Hong Kong

A light-hearted sharing on the EASE 2012 Summer School

First of all, I would like to express my sincere thanks to the organizers of the EASE summer school. I appreciate this opportunity to reflect, share and record the learning experience in the summer school during the time when many of us had made great efforts and achieved great improvements.

I enjoyed the international environment of the summer school very much. Participation in the activities provided me with rich opportunities to make friends from East-Asia regions, such as Taiwan, Japan, and Korea. We shared personal experiences, different cultures, and exchanged research ideas. The personal connections with researchers in science education from different places allowed me to learn more about science education in Asia contexts as well as educational contexts of various regions. As a result, my academic literacy has been fostered in the process of participation and contribution to the academic exchange. In addition, my English communication skills have been improved dramatically due to the international context.

This summer school is also a very precious opportunity for learning. In the formal sessions, a series of lectures given by prominent science educators broadened my academic perspectives. Every presentation promoted me to reflect on my own research in terms of research design and instructional design. Critical comments and feedback from researchers with diverse backgrounds refreshed my thinking. In the process of preparing and presenting the collaborative proposal, I have learnt how to identify potential research topics, integrate literature of a rather new area to me, and how to work in a team. Time limitation for constructing a grant proposal and cooperation among diverse-background-researchers offered good training for us to be academics in the future. Not only the content knowledge but also I have learnt a lot about how students from other regions learn and conduct research.

As a Mainland China student who is studying in Hong Kong right now, the summer school provided me with the opportunity to compare research studies conducted in Hong Kong and Mainland China. My personal background made me understand better the similarities and differences between the two areas in the way of conducting educational research. As a "product" of both these two areas, I hope I can benefit from the two patterns of thinking and serve as a bridge between them.

To sum up, I enjoyed, learnt and inspired in the summer school, and I would like to invite more students from Ease-Asia regions to join us.

MA Guanzhong, The University of Hong Kong, Hong Kong

2012 EASE Summer School: Sharing Research Ideas and Developing Collaborative Projects

2012 EASE Summer School was held at Beijing Normal University (BNU) from August 19th to 25th. About 10 professors, 5 coaches, and 26 Ph.D. students in the field of Science Education from 5 EASE constituent regions, Hong Kong, Japan, Korea, Taiwan, and China Mainland, attended this summer school.

At the opening ceremony on August 20th morning, Professor Lien Chi-Jui, the chair of East-Asian Association for Science Education, gave the opening speech, greeting to every participant, introducing the history of EASE, and pointing out that EASE aims at promoting communication and development of Science Education in East-Asian regions. After that, Professor Liu En-Shan, the chair of 2012 EASE Summer School and Science Education Research Center, Beijing Normal University, gave a warm welcome to every participant and introduced the history of BNU.

On August 21th afternoon, participants of 2012 EASE Summer School visited the Experimental High School affiliated to Beijing Normal University, so as to know the science teaching and STEM education in high school at Beijing.

"Group Discussions", containing "Dissertation Discussions" and "Collaborative Proposal", is a main part of 2012 EASE Summer School. All of the Ph.D. students attending summer school were divided into 5 groups, with 5-6 students, 1 coach and 1-2 workshop professors in each group. There are 5 sessions on dissertation discussions, 90 minutes each. During that sessions, every student was expected to present his/her dissertation study in the supportive group. Each session focused on only one student's study, 30 minutes presentation and 60 minutes discussion guided by the coach and workshop professor. Then, 3 sessions were focused on collaborative proposal, discussing and developing a cross-region collaborative research proposal each group. After each group present its proposal to all members of 2012 EASE Summer School, 2 excellent group proposals were chosen and rewarded at the end of the summer school.

Group Proposals in 2012 EASE Summer School

Topics	Workshop Professors	Coaches	Ph.D. Students
Group 1 "What is the perception of the key features of scientific inquiry-based teaching of highly accomplished science teachers from different East Asia regions?"	Alice Siu-Ling Wong (HK) Wang Lei (CHN Mainland)	Maurice Cheng (HK)	Chan Kam-Ho Kennedy (HK) Yoshida Miku (JAP) Lee Ji-Ae (KOR) Yu Chung-Chieh (Taiwan) He Ya-Qiong (CHN Mainland)
Group 2 "Students' Reasoning in Socio-Scientific Issues across East-Asian Regions and the Impact of Cultural Aspect on Their Reasoning"	Chin Chi-Chin (Taiwan) Liu En-Shan (CHN Mainland)	Jho Hunkoog (KOR)	Man Yuen-Wah Vivian (HK) Tembrevilia Gerald (JAP) Chung Yoon-Sook (KOR) Min Hee-Jung (KOR) Wei Xin (CHN Mainland)
Group 3 "A Comparative Study of Junior High School Curriculum Standards and Textbooks on Nature of Science (NOS) in East Asia"	Lien Chi-Jui (Taiwan) Lu Yu-Ling (Taiwan)	Takamatsu Shinichiro (JAP)	Chen Yu (HK) Hiwatig April-Daphne (JAP) Lee Hyun-Ok (KOR) Park Eun-Ji (KOR) Chen Yueh-Yun (Taiwan) Huang Ming-Chun (CHN Mainland)
Group 4 "Development and Evaluation of a Teaching Model of Creative Problem Solving for Socio-scientific_Issues"	Seo Hae-Ae (KOR) Shimizu Kinya (JAP)	Lee Sung-Tao (Taiwan)	Ma Guan-Zhong (HK) Kawahara Taro (JAP) Lee Jae-Sook (KOR) Yeh An-Chi (Taiwan) Yang Hong (CHN Mainland)
Group 5 "Secondary Science Teachers' Perceptions of Science Teaching: A Cross-Cultural Perspective"	Tuan Hsiao-Lin (Taiwan)	Wang Jian (CHN Mainland)	Xie Qun (HK) Takahashi Kazumasa (JAP) Park Ji-Sun (KOR) Ge Yun-Ping (Taiwan) Yang Wen-Yuan (CHN Mainland)

2012 EASE Summer School: Sharing Research Ideas and Developing Collaborative Projects

Besides, there were 7 lectures given to all attendees during the summer school.

Lectures Given by Professors in 2012 EASE Summer School

Topics		Lecturers	
1	"Learning from An-Eight Year Professional Development Journey in Teaching Nature of Science"	Prof. Alice Siu-Ling Wong	the University of Hong Kong, Hong Kong
2	"In Search for the Meaning of Science Education"	Prof. Kinya Shimizu	Hiroshima University, Japan
3	"Interaction between Science Education Research and Other Fields – An Example of Transformation and Transmission"	Prof. Lien Chi-Jui & Prof. Lu Yu-Ling	National Taipei University of Education, Taiwan
4	"Some Research Findings of Science Education for the Gifted in Korea"	Prof. Seo Hae-Ae	Pusan National University, Korea
5	"The Road We Walk – From a Colony to an Island"	Prof. Chin Chin-Chin	National Taichuang University of Education
6	"An Introduction to Rasch Model"	Prof. Xin Tao	Beijing Normal University
7	"Scientific Inquiry & Learning Motivation"	Prof. Tuan Hsiao-Lin	National Changhua University of Education

The closing ceremony was held on the morning of August 25th, and the 2012 EASE Summer School successfully closed. This summer school not only provided valuable opportunities for students in sharing research ideas, but also developed collaborative relationship among Ph.D. students from different regions in East-Asia, meanwhile, promoted the communication of Science Education in East-Asian regions.

SEE YOU NEXT TIME!

Wenyuan Yang (Beijing Normal University)

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Upcoming Conferences

- 2nd-Latin-American Conference of the International History, Philosophy, and Science Teaching Group, Oct. 3 - 6 2012 @ Mendoza, Argentina http://www.um.edu.ar/IHPSTLA2012/
- The 1st IHPST Asian Regional Conference. Seoul, South Korea. October 18-20, 2012.http://ihpst2012.snu.ac.kr/welcome.php
- 15th IOSTE International Symposium. Oct. 29 - Nov. 03, 2012 @ Tunisia. http://www.ioste.org/
- SSMA 2012 Annual Convention, Nov. 8-10, 2012 @ Birmingham, USA http://www.ssma.org/convention
- 2012 International Conference of ASET @ National Taipei University of Education, Taiwan. Dec. 13-15, 2012 http://www.sec.ntnu.edu.tw/fse2012
- ASE Annual Conference, Jan. 2 – 5, 2013 @ University of Reading, UK http://www.ase.org.uk/conferences/annual-conference/
- ASTE 2013International Conference, Jan. 9-12, 2013 @ Charleston, USA http://theaste.org/meetings/2013conference/
- AAAS Annual Meetings, Feb. 14-18, 2013 @ Boston, USA http://www.aaas.org/meetings/future_mtgs/
- The International Conference New Perspectives in Science Education Second Edition, Mar. 14 – 15, 2013 @ Florence, Italy http://www.pixel-online.net/npse2013/
- 245th ACS National Meeting & Exposition, Apr. 7-11, 2013 @ New Orleans, USA http://portal.acs.org/portal/acs/corg/content
- 2013 NARST Annual International Conference @Rio Grande, Puerto Rico. Apr. 6-9, 2013. http://www.narst.org/annualconference/2013conference.cfm
- NSTA 2013 National Conference, Apr. 11–14, 2013 @ San Antonio, USA http://www.nsta.org/conferences/2013san/
- The 7th World Congress of Environmental Education (WEEC) @ Marrakech (Morocco), June 9 -14, 2013 http://www.weec2013.org/en/
- The IHPST biennial Conference. Pittsburgh, PA, USA. June 19-23, 2013. http://ihpst.net/
- EASE 2013 Conference. Jul. 4-6, 2013 @ Hong Kong http://ses.web.ied.edu.hk/ease2013/
- ESERA Conference 2013, Sept. 2-5 @ Nicosia, Cyprus http://www.esera2013.org.cy/nqcontent.cfm?a_id=1
- ICASE 2013 Borneo. Sep. 29 - Oct. 3, 2013. Kuching City, Sarawak, Malaysia. http://worldste2013.org/conference.html

Call for Papers

We are very pleased to invite EASE members and other science educators and scientists to the forthcoming EASE 2013 conference. The conference aims to build an international platform for exchange between scientists and science educators. We hope that two academic groups, science and science education, in East Asia and around the world can be meaningfully and truly integrated at the conference through the active exchange of ideas, research findings, and expertise.

Participants intending to present a paper, workshop, or demonstration are requested to submit an abstract (150–500 words, English) by 30 November, 2012.The topics of the conference include, but are not limited to, educational studies in science, mathematics, technology, and the environment. All abstracts are required to be submitted via the EASE 2013 website. Young scholar awards and outstanding paper awards will be presented during this conference.

Invited Speakers

- Prof. Yu WEI, Ministry of Education, China,
- Prof. John GILBERT, Department of Education and Professional Studies, King's College London, UK
- Prof. Enshan LIU, Department of Biology, Beijing Normal University, China
- More to be added

Strands

1. Public understanding of science
2. Learning and teaching science
3. Development of science curriculum
4. Assessment of students' science learning and development
5. Teacher education and professional development
6. Integrating science with other areas of learning
7. ICT in science education
8. Historical, philosophical, social, cultural, and gender issues
9. Science education in life-wide, authentic, and informal contexts

Important Dates

- Abstract submission: *30 November, 2012*
- Early bird registration deadline: *30 April, 2013*
- Registration deadline: *31 May, 2013*

Secretariat

Department of Science and Environmental Studies, The Hong Kong Institute of Education, Hong Kong, China,
Phone: +852-2948-8696 Fax: +852-2948-7676
Email: ease2013@ied.edu.hk
Homepage: http://ses.web.ied.edu.hk/ease2013

Organizers
East-Asian Association for Science Education
Department of Science & Environmental Studies, Hong Kong Institute of Education

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