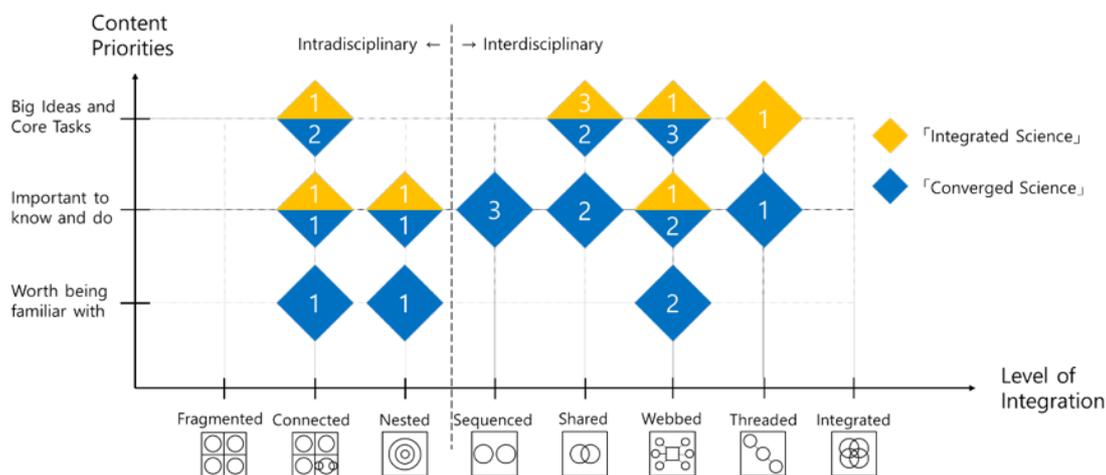


NEWSLETTER

My first participation and award-winning presentation at the 2018 international conference of KASE

In January 25-27, KASE (Korean Association for Science Education) held its international winter conference at Dankook University, Korea. I have heard a lot of praises about KASE conference from my colleagues, I expected many things to be learned from eminent scholars. Sure enough, there were many domestic & international participants presenting various research interests enthusiastically, as like the theme of the conference, 'Beyond the classroom: Expanding the boundaries of science education.' Thus, despite the cold weather, its atmosphere was quite heated. The research I presented on the first-day oral session (Lee, & Hong, 2017) was about comparing two science subjects in 2015 Revised National Curriculum of South Korea. The subjects, <Converged Science> and <Integrated Science> are kind of integrated science, which means Korean traditional separation of Physics, Chemistry, Biology, and Earth Science no longer exists in the level of content organizer, i.e. 'core concept'.



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My first participation and award-winning presentation

at the 2018 international conference of KASE

Gyeong-Geon Lee

Integrated PhD student

Department of Chemistry Education, Seoul National University, Korea

In January 25-27, KASE (Korean Association for Science Education) held its international winter conference at Dankook University, Korea. It was first time to me to participate and to present my research at the conference of KASE. However, as I've heard a lot of praises about KASE conference from my colleagues, I expected many things to be learned from eminent scholars. Sure enough, there were many domestic & international participants presenting various research interests enthusiastically, as like the theme of the conference, 'Beyond the classroom: Expanding the boundaries of science education.' Thus, despite the cold weather, its atmosphere was quite heated.

The research I presented on the first-day oral session (Lee, & Hong, 2017) was about comparing two science subjects in 2015 Revised National Curriculum of South Korea. The subjects, 「Converged Science」 and 「Integrated Science」 are kind of integrated science, which means Korean traditional separation of Physics, Chemistry, Biology, and Earth Science no longer exists in the level of content organizer, i.e. 'core concept'. Notably, 「Integrated Science」 was meant to use important 'Big Ideas', to be better subject than 「Converged Science」 (Song et al., 2014), because the latter was also component of previous national curriculum of South Korea and had been criticized for a few reasons. I analyzed each 'core concept' of both subjects, in 2-dimensional viewpoints of content priorities (Wiggins, & McTighe, 2005) and the level of integration (Forgarty, 1991; Fogarty, & Stoehr, 2008). Visualizing the numbers of 'core concept's according to the analysis results as a coordinate were like Figure 1, which indicates 「Integrated Science」 has fewer, more important, still integrative 'core concept's compared to 「Converged Science」, to accomplish the subject's developmental purpose.

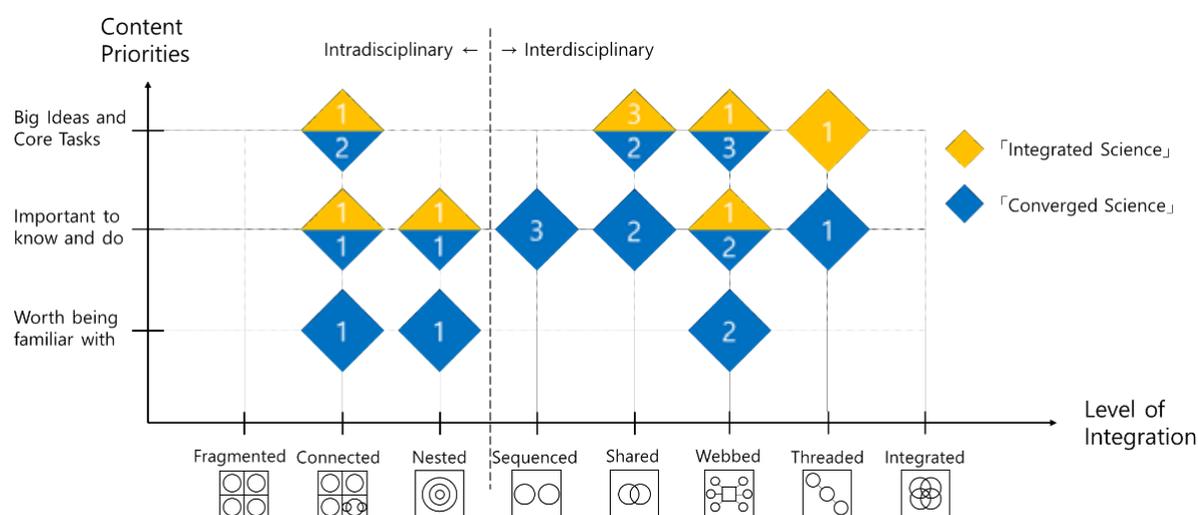


Figure 1. Comparison of Numbers of 'Core Concepts of the 「Integrated Science」 and the 「Converged Science」

On the 2nd and 3rd day, I heard invited speeches and impressed by Jesper Sjöström's one (Figure 2). Although many related terms such as 'scientific literacy', 'SSI(Socio-Scientific Issues)', 'NOS(Nature Of Science)', 'STSE(Science-Technology-Society-Environment)' were not new to me, Bildung was a sort of widening my viewpoint. It was because, as far as I had understood, Bildung would make those little bit idealistic (in Korean classroom context, maybe) terms and slogans more feasible. It was fortunate to hear his speech to have a broader view for further research of mine. And also, on 3rd day, I was so honoured to have received the best oral presentation award. It was surprising to me because I could not expect it at all. On reflection, during three days of KASE conference, I have learned and experienced what I had not. And it was not only to expand the boundaries of science education but also to expand my thought

horizon. As a beginner of science education field, I would like to participate in next KASE conference with humble and glad mind.

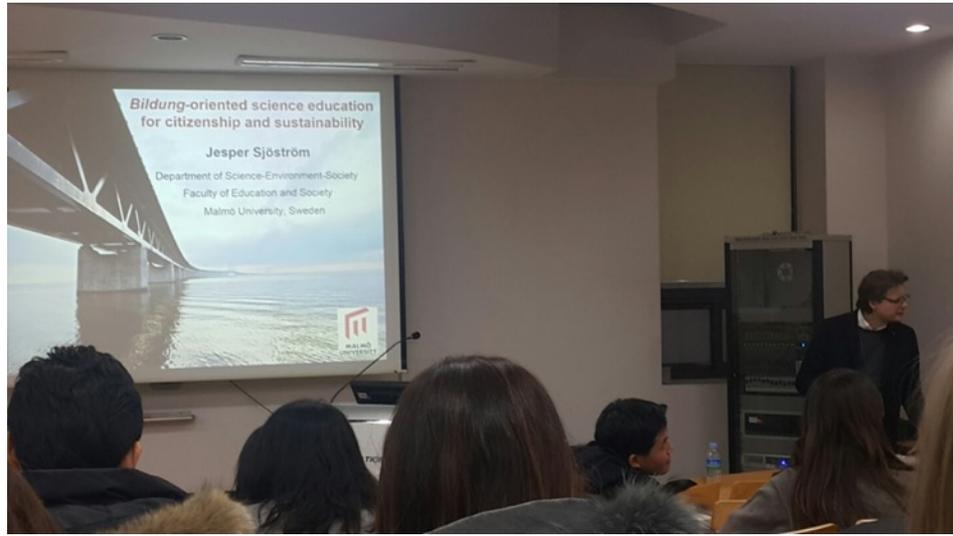


Figure 2. Invited Speech of Jesper Sjöström

Reference

- Fogarty, R. (1991). Ten ways to integrate curriculum. *Educational leadership*, 49(2), 61-65.
- Fogarty, R., & Stoehr, J. (2008). *Integrating Curricula with Multiple Intelligences* (2nd Ed.). Corwin Press.
- Lee, G. -G., & Hong, H. -G. (2017). A Comparison of 「Integrated Science」 and 「Converged Science」 of the 2015 Revised National Curriculum through Core Concepts. *Journal of the Korean Association for Science Education*, 37(6), 981-992. (<http://dx.doi.org/10.14697/jkase.2017.37.6.981>)
- Song J., Kang, N., Kwak, Y., Na, J., Bang, D., Son, Y., Son, J., Shim, K., Lee, K., Lee, B., Jeon, H., & Choi, I. (2014). *Research on Restructuring Science Curriculum Integrating Liberal Arts Track and Natural Sciences Track*. Sejong: Ministry of Education.
- Wiggins, G., & McTighe, J. (2005). *Understanding by design* (Expanded 2nd Ed.). Alexandria, VA: ASCD.

Reflection from the attendance on the international conference

at the 2018 international conference of KASE

Anjar Putro Utomo

University of Jember, Indonesia

Let me introduce myself first. I am Anjar Putro Utomo from Indonesia. Specifically I come from Jember-East Java. Java is the widest island with the biggest population in Indonesia. I am a lecturer in Science Education Department-University of Jember. I am in charge for many courses and some researches in my department. Unfortunately, I am very happy with all of that :).

In this 2017, I got fortune from my God by presenting me a chance to visit South Korea (Ewha Womans University) for 3 months. I got scholarship from Islamic Development Bank (IDB) that is managed by 4-consortium Indonesia public university. One of them is University of Jember. I applied for "Non Degree Training Program" for it. Then it is time to me having another flight to abroad.

Night Friday on 31st November 2017, I met with my supervisor Prof. Hynju Lee and with my lab mates who are Jinny, Suhi, and Anggela. After that we had a dinner in Asian cuisine restaurant near Ewha Womans University except Angela. This night was the first time I started talking about my religion (Islam). Because they asked me, "What do you want? Please choose". I was instantly silent and thinking to answer their offer. Bravely, I stated to them that "I am very sorry, I am a Moslem. I do not eat pork and any non-halal meat. I do not drink bear and any drinking contained alcohol. Suddenly, they turn to be silent and looked back each other. They looked very confuse regarding this. Then, I initiated to explain about it. We did chat till 9 pm. We shared some talk about our own culture especially regarding halal food due to I am a Moslem. They did not realize and did not understand about that one before. So, it made me feel little bit inconvenience to them especially Prof. Lee. Even they said "it is okay, take it easy". And the world that made me more feel inconvenience is "I am sorry, we do not know about that". I feel stuck at that same time, and then I think, "What should I do and say next?" Every think was going freeze at the first time, but it became melting till the end of our conversation. At that time I just think, all of them must know about Islam. And in the other side, they looked interesting by asking about halal food and the other side about Islam to me. I was very happy and impressed at that night by meeting with a nice supervisor and lab mates. "My journey is begun".

December3rd 2017, I woke up with a stranger situation. But, it is really interesting. I was starting with 100% prayer and expectation to gain any new knowledge from Prof. Lee and all of my lab mates in room 554 building B Faculty of education-Ewha Womans University. Actually we had separate room among Prof.Lee, my lab mates and I. I feel many thanks to Prof. Lee because she lent her room to me. How fortunate I am! Besides that, I am a second youngest lab member in Prof. Lee's Lab. I must proud of it, but still I am not the youngest one :). I spent my beginning of work time in my room to finish rest of my office work in University of Jember. I need 3 days for it, and then I focused on my work for my training program at Faculty of Education-Ewha Womans University. We have weekly seminar every Wednesday. In the first my joining seminar of lab 554, I have just became a good audience. Because I need to adapt and adopt any important things, which were, I must understand. First impression of first weekly meeting is communication and collaboration style of them. They made well communication and collaboration as a supervisor, students, and lab mates to create good idea and good progresses in every week. They can freely reveal any their idea without any awkward. Prof. Lee can create good atmosphere in our communication as well as all of lab member can give well responses for it. It looked like they have match chemistry each other. This is really beautiful academic circumstance. It just my perception of them in the first meeting without compare to other lab situation. Even though, I feel that may be it is difficult to find this such situation outside; I guess. Thus, it is why; suddenly, it changed my mind about relationship among supervisor, students, and lab mates. Moreover, I participated every Wednesday in a week. I did not want miss every single meeting with them. Because for me, every our single session even it is a laugh and kidding, those contains a support and insight. I learnt many things every week from all of them especially from Prof. Lee. Socio-scientific issues (SSI) approach is one of other knowledge that we discussed a lot almost in every week. It is new for me. I have ever heard before but I never concerned about it. Since I have met with them, then I started to be interested learning deeply about SSI. And I have had plan to implement it to my classes as well as to do research related with it in Indonesia.

Another activity is school observation. I observed elementary school that has STEAM class due to my aim of training program is about STEAM teaching and learning in the school practice. I met with the science teacher who one of the trainer teacher for STEAM education. The name is Jinny. She is very humble and kind. She is pretty young for a trainer teacher. She was chosen by government to be trainer

teacher. She knows well about STEAM education. And it was my opportunity to ask many things regarding STEAM to her. I joined and observed in her class for 3 times. The class is very interesting with much kind of hands on and minds on activities. Even all of silos of S-T-E-A-M did not integrate in one period of class. However STEAM activities in South Korea especially in Jinny's class still integrated 2/3 of STEAM silos in their class activities. Prof. Lee as one of supervisor for STEAM teacher training at Ewha Womans University said, "It is surely difficult to integrate all of STEAM silos in the same time." I realized that one before I come to Korea actually. Even though, I could get many ideas, inspiration, and knowledge all of things related with STEAM education especially in South Korea condition. I think, her class activities can become a good model for STEAM education class in Indonesia case.



International KASE conference in Dankook University, maybe it was the extremely having the expression to me. We spent 3 days our conference time together to receive any information and insight that we do not know before. I got lost in first day in another Dankook University location. It made me crazy because my Indonesia friends and I did not know the way to come back. More over I have not registered yet for this conference. We tried hard to communicate with Korean even we did not know everything about Korea language. Eventually, we could come to the right conference place. I was relieved. I entered to the opening English session by being late. After that I told to Prof. Lee about that story, and she said, "Starting from tomorrow, we can go to Dankook University together." By this event, I can gather together and having some coffee plus cakes every day with Prof. Lee and my lab mates. We had many talk. And I was much more realized that I had family here. This session of conference is not only non-academic taste that I got, but also I could meet with people and some professors who I recognized before. We had some chat and discussion related with research and our academic plan. STEPWISE and PARRISE Project presented in this conference are new paradigm and vision in science education that I can implement in my country in order to higher education quality of science education of Indonesia. This event really made me feels lucky student in the world.

Three weeks after that, February 23rd 2018 exactly, It is time for me to say good bye to my new family. We pass through 86 days with joyfulness. Impression things can not arise without willingness. May be this word can reflect those 86 days of my attending in 554 lab. I think we have a motto for our lab from me that is "never days without laugh". Hehhehhehe....

Prof. Lee, Hwang, Kongju, Angela, Ok, Choi, Kim, Jinny, Suhi, and Hee, thank you very much for making color in my days there. Indeed, the important thing is I can call all of you Nunim, Nuna, and Hyeong . I will miss to laugh with all of you. Hopefully, I can visit all of you again someday and vice versa. It looks like something.... As if the color in snow.

How to foster the new generation in preparation for the future society:

The introduction of ‘Glocal Social Changes & Educational Responses’ project in Korea

Jina CHANG

Researcher of the GCER project, Seoul National University

The future society in East-Asia including Korea is in the phase of educational crises and innovations as it enters the era facing with the two main glocal changes: The low-fertility era as a local change; the hyper-connected era as a global change. For fostering young generation in preparation for the future society, we should consider these changes and their educational impacts. In this context, as educators, we need to think more deeply about how to foster the new generation in response to the future changes.

The Glocal Social Changes & Educational Responses (hereafter ‘GCER’) project have struggled with this issue. GCER, a three-year project led by the Social Sciences Korea (SSK) and sponsored by the National Research Foundation (NRF) and the Ministry of Education in Korea, started in September 2016. The research group of GCER consists of 12 researchers from various education areas such as education administration, educational psychology, curriculum, mathematics education, and science education. One of the main chiefs of the group is Prof. Jinwoong Song who was the second president of EASE. Including Prof. Song, Prof. Yong Jae JOUNG (Gongju National University), Prof. Sonya N. MARTIN (Seoul National University), Prof. Jiyeon NA (Chuncheon National University), Dr. Jina CHANG (Seoul National University), Jin Hee KIM (Seoul National University), Wonyong Park (Seoul National University) and Da Yeon KANG (Seoul National University) are currently participating as key members of this project. In addition, other science education researchers in EASE are also participating directly and indirectly with GCER members in the sub-projects.

In the GCER project, the researchers have assessed the impact of a low-fertility and hyper-connected society in educational context. We also analyze classroom culture and educational system in societies with low-fertility rate and hyper-connectivity. Ultimately, we aim to suggest innovative educational values, theories, and strategies to cope with the declining population and hyper-connectivity issue. The research interests of the GCER project are as follows:

Research Topics of the GCER project

- 1. Research on Classroom Culture in a low-fertility and hyper-connected society**
- 2. Research on Educational System in a low-fertility and hyper-connected society**

Published papers in the science education part of the GCER project (2017)

Kim, J., Na, J., & Song, J. (2017). Exploring the possibility of forming the strategic community of practice for science education: A case of science core schools in Korea. *Journal of the Korean Association for Science Education*, 37(1), 169-179.

Na, J., & Jang, B-G. (2017). The perspectives of pre-service elementary teachers on science education of future. *The Korean Elementary Science Education Society*, 36(1), 85-94.

Joung, Y. J., & Chang, J. (2017). Development and application of the measuring instrument for perception of science classes based on the view of ‘Community of Inquiry in Science Classroom.’ *Journal of the Korean Association for Science Education*, 37(2), 273-290.

Chang, J., & Joung, Y. J. (2017). How does the introduction of smart technology changes school science inquiry?: Perceptions of elementary school teachers. *Journal of the Korean Association for Science Education*, 37(2), 273-290.

Lim, I., & Song, J. (2017). The concept of ‘Wisdom’ and its perception according to a survey of science teachers. *Journal of the Korean Association for Science Education*, 37(4), 731~745.

Kang, D. Y., & Martin, S. (2017). Examining the impact of an experiential learning special education course on pre-service science teachers’ perceptions about inclusive science education. *The Journal of Special Education: Theory and Practice*, 18(4), 327-356.

Chang, J., Cho, H., Kwon, O. N., & Joung, Y. J. (2017). Teachers’ practical concerns and choices in implementing and designing of mobile-based problem solving: Focusing on the case of elementary science and mathematics gifted students. *Teacher Education Research*, 56(4), 519-536.

The GCER project has also tried to make networks with international research partners around the world including East Asian countries. For example, last winter, the first GCER-ToSEF international forum was held under the theme of 'Educational Initiatives for the Future Society.' At the forum, Prof. Ying-Shao HSU (National Taiwan Normal University, Taiwan) and Prof. John Lawrence BENCZE (University of Toronto, Canada) delivered the keynote speeches.



Figure 3. The First GCER-ToSEF International Forum

The GCER team would like to expand educational discussions on the global issues in the East Asian region with EASE members through conferences, workshops, seminars, and other networking activities. If you are interested in the GCER project and our research topics, please visit the website of GCER (www.gcer.or.kr) and contact us. Thank you!

To assist the development of the primary school in the school-based curriculum of "sustainable agriculture"

Chih-Chung Tsai

Graduate Institute of Science Education and Environmental Education, National Kaohsiung Normal University

The science education and environmental education institute of National Kaohsiung Normal University is located in southern Taiwan, with the concept of sustainable development, to get the balance between sustainable development and ecological environment maintenance. The research team cooperates with the primary school to assist the school-based curriculum in "sustainable agriculture", "low-carbon life" and "local industry and culture" and other interdisciplinary environmental issues. The design of curriculum integrates the slow food concepts, through the inquiry-oriented teaching activities of the actual visit, discussion and practice, to strengthen students' identity in hometown, carry forward the transmission of the local culture and experience, establish friendly behaviors to the environment and nature, and have positive pro-environmental behaviors.

The curriculum design begins with the discussion between the team, led by professor, and the school authority, and the curriculum includes the first part of the traditional energy kiln and the construction and understanding of the oven, and the second part of "interesting diet community" courses, from the use of the traditional energy to the combination of local culture. Kiln body is made from water vats, and the pithos is the traditional appliance for pickled vegetable, it is also one of the early industries, so the use of the pithos made through high temperature to replace the cement to make kiln body, can match up the course to make the students understand the local industry and diet traditions. The oven is also traditional diet cooking equipment, even the popularity of modern gas furnace, the oven is seldom used, but in the Mino region at southern Taiwan, there are still families selecting firewood cooking when making dishes for the lunar New Year, including the cabbage closure and halogen pig feet, and the sweet rice cakes and other rice diet, so the teaching purpose, in addition to retain the traditional flavor, also can let students understand the early human energy, and the energy regeneration effect on the environment sustainable development.

As the teaching plan practice, we set up the teaching operation model in the form of the school association, and the teaching goal of the teaching plan focuses on the main shaft of the interdisciplinary fields of natural science and integrated activity in national basic education of twelve years, integrates the environmental education issues as a conceptual framework, and the application of the local food material for learning in the course content, to build the learning situations of the environmental education.





The curriculum design is based on the subjects, including the learning goals of knowing of regional economy and food crops, understand the importance of local culture resources to the regional sustainable development, team training, personal improvement and food security issues. Using the local farming for food materials, the students can combine life experience, match up the original natural farming method of teaching in school, and use Mino characteristic food materials from local farming cultivation, to innovate, design and make dishes containing traditional (hakka) flavor elements. In the end of the curriculum, we will publish the association achievement exhibition as one of the evaluation measures to understand whether the students can achieve the improvement of team ability and personal ability after learning.

The diet and farming education combines the environment education issues to integrate into the teaching of the local life experience, through the teaching, the kiln and oven in the school are no longer traditional energy equipments, also become the symbol and inheritance of the campus, and the practice is close to the life, also improves the parent-child relationship and enters the community, and then promotes the concepts of sustainable agriculture material cycle and energy conservation and carbon reduction, to make the students have deep emotion on land and the environment, know more about their hometown, and then service for their hometown earnestly. The purpose of the diet and farming education is to understand and learn the spirits of getting from the nature and cherishing the nature, and through the combination of community resource utilization and both teaching and learning, to implement the concept of sustainable management and education.

International Day of Women and Girls in Science in Taiwan:

An example of GuangFu Railway Station in Hualien

Jing-Wen Lin, Yin-Hsuan, Tseng

Graduate Institute of Science Education, National Dong Hwa University

Since 2015, the United Nations Educational, Scientific and Cultural Organization (UNESCO) has designated February 11th as the International Day of Women and Girls in Science. This day was created in the hope of eliminating gender inequality and encouraging more girls and women to join science. Ministry of Science and Technology (MOST) in Taiwan has been pushing forward the activities of science year after year, and showed great results on International Day of Women and Girls in Science in Taiwan. A lot of professors and school teachers participated passionately without the support of women's technology-related projects. They took the initiative to find funding and resources, share experience and help each other to complete the activity. They are the best role models for female in science.

At this day, the teams of science popular from different universities and 17 girls high schools all over Taiwan jointly held various scientific events on February 11th. Through railway stations in various places of Taiwan with pop-up events, let more people understand the meaning of "International Day of Women and Girls in Science", then support the idea of female participation in science and realize the value of gender equality.

If you want to realize about International Day of Women and Girls in Science in Taiwan, please click the following link:

<https://www.youtube.com/watch?v=HzLZ6BHfpms&t=5s>



Figure 1. International Day of Women and Girls in Science at the GuangFu Railway Station

In response to the International Day of Women and Girls in Science, the team for Science Week in South Hualien at National Dong Hwa University cooperated with GuangFu and FuYuan Junior High schools to organize science activities at the GuangFu railway station on February 11th.

It is worthwhile to mention that the girl students from these two Junior High schools are the youngest students took an active part in this event. Therefore, we selected this team as the example. They were encouraged by two female school principals with science and mathematics background. This event is not only to encourage more girls and women to join science, but also to pray for the deadly 6.4 magnitude earthquake disaster (2018.2.6) in Hualien (CNN, 2018).



The participants wrote down their encouragements and blessings for Hualien earthquake and future female scientists.

The students of Guang-Fu Junior High School applied lever principle to make white balanced-pigeons which symbolize peacefulness and illustrate the principle of leverage. At the same time, the students of Fu-Yuan Junior High School applied the three elements of sound (loudness, audio frequency, tone color) to create horn-like sounds. The sounds represented their blessing to Hualien. Through the combination of science and blessing, let more people learn about science, then realize and love it.



The students from GuangFu Junior High School (left, balanced-pigeons) and FuYuan Junior High School (right, suona horn-like sounds) to accomplish this scientific event together.

The event was very grateful to the principals of Guang-Fu Junior High School and Fu-Yuan Junior High School. Because of their strong support, this scientific activity can be successfully completed. In addition, the people who participated in this activity have given us more power and encouragement. The project investigator of the Science Week in South Hualien, Prof. Jing-Wen Lin hoped that more people can be involved in science education, improve their scientific literacy, and use science to prevent disasters in the future. The most important is that let science become part of our lives.



The principals of GuangFu Junior High School (left) and Fu-Yuan Junior High School (right) gave a great support to the event

If you want to know more about this event in South Hualien, please click the following link, and enjoy it!

<https://www.youtube.com/watch?v=5GvSY1kHPg&feature=youtu.be>

References:

1. CNN (2018). Taiwan quake: Tited buildings, people trapped. 2018.2.25 retrieved from <https://edition.cnn.com/videos/world/2018/02/07/taiwan-earthquake-hualien-bks-sje-lon-orig.cnn>

The incorporation of STEM in Hong Kong science curricula has created an urgent call for reforming our pre-service teacher education. Our double degree undergraduate program (BEd&BSc) received an 18-month Teaching Development Grant from the university in 2016-18 to integrate a number of changes for preparing the student teachers in coping with this challenge. The guiding principles of this teaching initiative were:

- **Learner-centred:** The interests and needs of student teachers were revealed from the questionnaire and interviews, and informed the design of our programs.
- **Integrated** and not segregated into different disciplines (Sanders, 2009): STEM education from the kindergarten to secondary schools has been criticized for lacking integration (English, 2016), for example, the agenda ‘mathematics for all’ can be underscored in a number of programs (e.g. Marginson, Tytler, Freeman, & Roberts, 2013). In response to such concerns, we collaborated with our mathematics educators to provide core and elective courses in connecting science and mathematics education. Some discussions in the courses revolved around examples of STEM education in local schools. In the lessons, we also made use of an experiential approach that involved our student teachers as school pupils in the activities. Our training emphasized 21st century skills such as ICT, creativity, self-directed learning and collaboration. There was an intensive workshop for interested student teachers to further strengthen their skills in teaching STEM.
- **Providing STEM-related learning experience:** To strengthen the practices, more than 40 student teachers became STEM Ambassadors at the Hong Kong Science and Technology Parks Corporation - the largest innovation hub in Hong Kong - to develop and trial-out curriculum materials for school pupils’ robotics workshops that had strong emphasis on scientific concepts. Some student teachers were involved in other activities related to K-12 students. We also had other community partners such as Next Generation Cultural Association to place our student teachers as assistants in school-based innovative workshops.

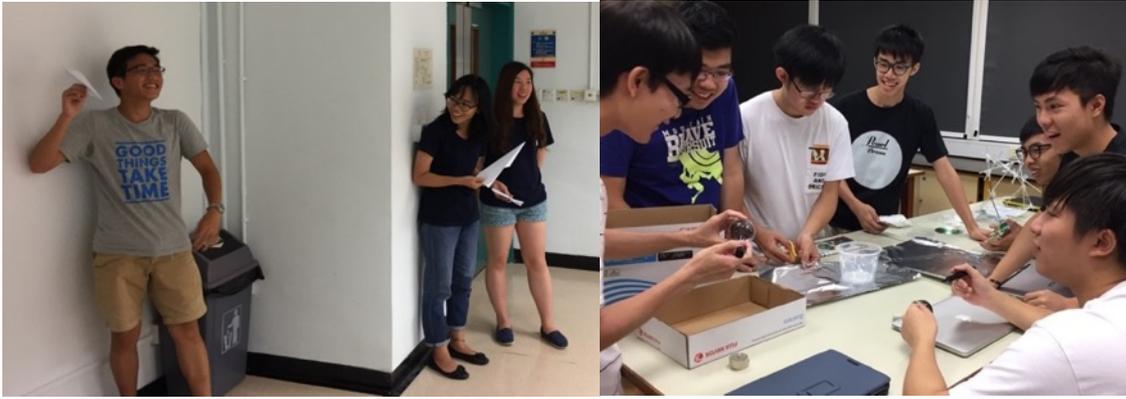
Other than the collaborative work with partners, we organized a Singapore study trip for our student teachers to better understand STEM education in an overseas context. Another trip was organized for the students to visit two Shenzhen (China) STEM start-up firms so that they would know how STEM industries develop.

From the feedback of the student teachers, many of them had got better understanding of STEM education, and were more ready to teach STEM in the future. They acknowledged the importance of integrating the ‘theories’ and ‘practices’ through various courses and gaining hands-on experience by working with the community partners. Our future initiatives to develop more competent STEM pre-service teachers would include further provision of STEM pedagogy courses, workshops and experiential learning courses, allowing them to visit schools and/or observe STEM lessons, and encouraging them to teach STEM in their professional practicum.

References

- English, L. (2016). STEM education K-12: perspectives on integration. *International Journal of STEM Education*, 3(3). DOI 10.1186/s40594-016-0036-1.
- Marginson, S., Tytler, R., Freeman, B., & Roberts, K. (2013). *STEM: country comparisons*. Melbourne: Australian Council of Learned Academies.
- Sanders, M. (2009). STEM, STEM education and STEMmania. *The Technology Teacher*, 68(4), 20-26.

Course activities



Singapore study trip



Bringing biotechnology experiments

into Hong Kong secondary school through Amgen Biotech Experiences

Kwok-Chi Lau

The Chinese University of Hong Kong

Amgen Biotech Experiences (ABE) is an educational program aimed at bringing molecular and biotechnology labs into secondary schools. The program was originated in the US and has now expanded to the Europe and Asia Pacific including Hong Kong. The Chinese University of Hong Kong is hosting the ABE program in Hong Kong since 2016. Until now, the program has engaged over 500 students and 40 biology teachers from over ten secondary schools in Hong Kong. This is the first time biotech labs are implemented in Hong Kong schools in such a scale and we would like to report how the program works and discuss the issues and challenges we have faced in the process.

The program has developed a series of biotech lab protocols from restriction digestion to the construction of recombinant bacteria expressing red fluorescent protein. The biology teachers and lab technicians are first trained and then provided with all the equipment and materials to do the labs with their students at schools. The initial outcomes are encouraging with overwhelming enrolment from schools and most students expressing great interest and excitement in doing the labs. The success comes as a result of overcoming many challenges. First of all, we have to make sure these complex and sophisticated labs can produce the expected results within normal class time. Special gel system, Polymerase Chain Reaction machine and even plasmids and enzymes are carefully chosen to make sure the reactions are reliable and fast. All the lab materials and equipment have to be checked thoroughly before sending out to schools. The timing of delivery and storage of the DNA, enzymes and competent cells are crucial as no schools would have -20°C and -80°C fridges! But the most important is the curricular and pedagogical planning. Most students are the first-timers to use a micropipette, so adequate practice on its use is crucial to the success of all the labs. In addition, we made the lab manuals as text-free, pictorial and self-explanatory as possible, where all the unnecessary technical terms and abbreviations are removed. To arrange for the wait time is also a big challenge – number of hours needed for PCR, restriction digestions and ligation, not to mention overnight bacteria incubation. The labs have to be carefully scheduled within the two to three 80-minute periods of biology class a week. The tight teaching schedule in Hong Kong also makes teachers do as many labs as possible within the two-week period that we load them the equipment. As such, teachers are focusing mainly on the practical procedure without adequate discussion on the relevant theories and experimental design. This has compromised the potential values of the ABE labs to integrate theory learning with practical work. Nevertheless, given that an optional module of the senior biology curriculum is all about biotechnology, we are optimistic that the ABE labs would become a core part of biology teaching and learning in Hong Kong.



Prof. BaoHui Zhang Gave A Keynote Speech

at the 7th International Conference on Science and Mathematics Education in Penang, Malaysia

The Seventh International Conference on Science and Mathematics Education 2017 (CoSMEd 2017) was held from 13 to 17 November 2017 in SEAMEO RECSAM, Penang, Malaysia. Prof. Bao Hui Zhang, President-elect, International Council of Associations of Science Education (ICASE), executive committee member of East Asia Association of Science Education (EASE), School of Education of Shaanxi Normal University was invited to give a keynote speech at the conference. The title of his talk was “iMVT Science Learning Model”. The abstract of the talk was “iMVT stands for Modelling and Visualization Technology integrated inquiry-based Science Learning. It was invented based on learning sciences research projects in classroom in the US, Singapore and China. A model is a representation of a real thing/science phenomenon. A model might have different parts/variables that are interrelated; one variable can affect other variables and might also be affected. A model as a whole highlights certain aspects of a system. Modelling is the process of designing, testing, revising/abandoning models. Because modelling is at the centre of scientists’ work, many countries promote modelling/computer-based modelling for science learning in order for K-12/college students to understand the concepts, processes and the nature of science.”

Prof. Bao Hui Zhang then gave a workshop as a follow-up hands-on session. The workshop introduced the speaker and his collaborators’ efforts in developing and implementing iMVT curricula in elementary science, high school chemistry, physics, biology, geology and the like in the US, Singapore and China. The speaker called for more research in using modelling and visualization technologies in science learning. Furthermore, science educators should produce more large scale projects that not only introduce iMVT model, but to sustain and scale up the efforts. Both the keynote talk and the workshop were well-attended and received positive responses according to the conference organizer’s post-survey.



Collective Photo of Conference Delegates



Prof. Zhang Gave A Keynote Talk



Prof. Zhang Organized A Workshop

Science Seminar in Hiroshima, JAPAN:

Presentations and competitions of high school students' science, mathematics, and information technology research

Takuya Matsuura

Hiroshima University, Japan

Science seminar in Hiroshima was successfully held at Hiroshima City University, Hiroshima, Japan, 27 January 2018. This seminar is organized by Hiroshima prefectural educational board and sponsored by JST (Japan Science and Technology Agency) support program for middle school students. The purpose of this science seminar is to enhance the students' attitude toward science, mathematics, and information technology, and to develop their abilities in each area. All of 87 teams (267 students) who came from 23 high schools in Hiroshima prefecture presented their results that researched at this school year. Every 10 sessions (two physics, two chemistry, three biology, one earth science, one mathematics, one information technology) were conducted by oral presentation and students have discussed with participants and supervisors (university professor, high school science teacher and so on). For example, the topics of students' research are listed below.

- Resonance of sound
- Simulation using the marble about movement of many people
- Protein
- Semipermeable membrane
- Killifish
- Recurring decimal



people



After the presentations, students reflected on their research procedures, data analyzing, and presentation skills. Finally, supervisors in each sessions have judged some awards for good research and presentation.

Upcoming conferences

International Science Education conference 2018

Re-searching Science Education: Same Issues from Different Lenses

June 19-21, 2018 @ National Institute of Education NIE, Singapore

The International Science Education Conference 2018 is jointly organized by the Ministry of Education Singapore and the National Institute of Education, Nanyang Technological University, Singapore. The theme "Re-searching science education: Same issues from different lenses" aims to provide a platform for intellectual dialogue on issues in science education using alternative lenses. Many problems in science education are not new, but can be addressed with new lenses to identify different or unique strategies and solutions. The word "re-search" is intentionally hyphenated to underscore the importance of constantly re-looking and re-examining previous issues so as to gain new insights into familiar problems that confront diverse stakeholders in science education. Through such a process, the field of science education will progress and be enriched.

Conference Website: <http://www.isec2018singapore.org/>

Important Dates

Deadline for submission of abstracts – 27 September 2017

Email notification of acceptance or rejection – 15 December 2017

End of early-bird rate for conference – 15 January 2018

Deadline for submission of full paper – 31 January 2018

Keynote Speakers (in alphabetical order)

Dr. Vanessa Kind, School of Education, Durham University, U.K.

Dr. Sonia Martin, Science Education Faculty, Seoul National University, Seoul, Korea

Dr. Subramaniam Ramanathan, Natural Sciences & Science Education Academic Group, NIE, Nanyang Technological University, Singapore

Dr. Victor Sampson, College of Education, The University of Texas at Austin, U.S.A.

Inquiries to: isec2018@nie.edu.sg

The 42nd JSSE Annual Conference

August 17-19, 2018 @ Shinshu University, Nagano, Japan

The 42nd Annual Conference of Japan Society for Science Education (JSSE) will be held at Shinshu University (Nagano Education Campus), Nagano, Japan in August 17-19, 2018. The conferences have featured symposia, contributed papers and interactive sessions. For more information, please visit the website <http://www.jsse.jp/jsseam/modules/note4/>

The Japan Society for Science Education (JSSE) was founded in 1977 to contribute to the progress and diffusion of "Education in/about science" and "Education by scientific and technological methods." For this reason, the areas of research covered by the JSSE are inherently broad (please see the Profile page). With greater attention being focused on a science-technology-information based society, the promotion of the "nation-building on the basis of innovative science and technology" policy by the Japanese government, the lack of interest in science among children and the general public, and the current growing attention to science communication, the JSSE has further expanded its areas of research in recent years.

Inquiries to: jsseam42@gmail.com

2018 International Joint Conference of East-Asian Association for Science Education and Association of Science Education in Taiwan

November 29 – December 2, 2018 @ National Dong Hwa University, Hualien, Taiwan

2018 EASE & ASET International Conference will be held at the National Dong Hwa University, Hualien in 2018. The theme of the conference is a dialogue between the local and the global. This conference is co-hosted by EASE and ASET, and there are a number of prominent scholars around the East-Asian regions. The paper submission is already opened and the deadline of submission is May 1st.

Keynote Speakers

Cheng May Hung, The Education University of Hong Kong

Yoshisuke Kumano, Shizuoka University

Jeonghee Nam, Pusan National University

Mei-Hung Chiu, National Taiwan Normal University

Hu Wei ping, National Demonstration Center for Teacher Training Development

November 29 - December 2, 2018

National Dong Hwa University, Taiwan

For more information, visit:

<http://2018ease-aset.ndhu.edu.tw/en/>

Or contact:

Chia-Ling Chiang, clchiang@mail.ndhu.edu.tw

Jing-Wen Lin, jingwenlin@mail.ndhu.edu.tw

Registration information coming soon!

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