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Beijing Normal University
No.19, Xinjiekouwai Street
Beijing, China
+86-10-58805862
Fax: +86-10-58802075

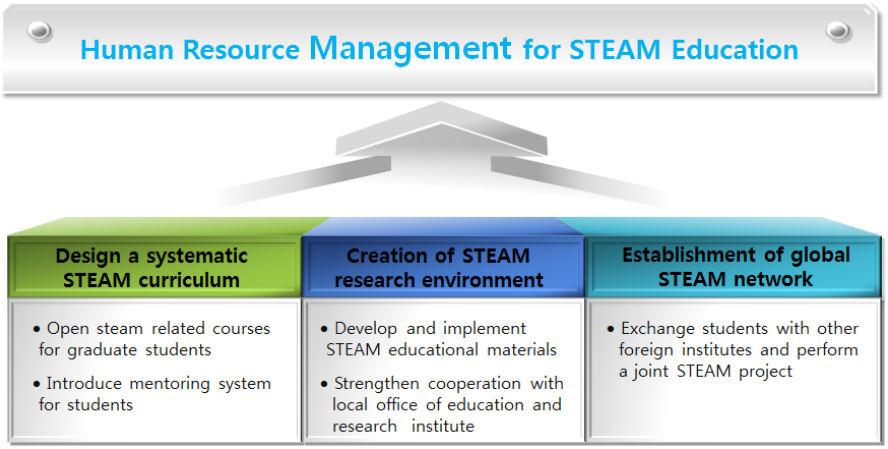
Human Resource Management for STEAM Education:

Brain Korea 21 Plus Project at Kyungpook National University

Youngshin Kim
Kyungpook National University, Daegu, South Korea

Researchers in the Department of Science Education at Kyungpook National University have been conducting a seven-year BK21 plus project entitled '**Human Resource Management for STEAM Education**'. This project is supported by the Ministry of Education in Korea. The Ministry has been focusing on nurturing creativity in future generations who will lead the economy of new technologies and knowledge. In order to cultivate creativity in human resources, the Ministry introduced STEAM (Science, Technology, Engineering, Art, and Mathematics) education into a new curriculum in 2009. STEAM education is an integrated teaching and learning approach, where the content knowledge is not treated as isolated or discipline specific—rather it is regarded as an integral part of a whole to make learning dynamic and holistic.

In order to support STEAM education at school, it is essential to have good quality curriculum materials and well trained teachers. This research project thus aims to construct a research environment where high quality curriculum materials are developed and tested, and professional STEAM educators are educated and nurtured systematically to an international standard. In this regard, our efforts are three-folds. One is to design an effective STEAM curriculum. Second is to create a productive STEAM research and learning environment. Third is to establish a global network of STEAM educators.



We have been designing a STEAM-oriented curriculum to enhance STEAM literacy for both students and teachers. Involving pre-service and in-service science teachers in the development of various STEAM curricular materials will help promote their research capacity in relation to STEAM education, and give them confidence as a STEAM educator and researcher. We also aim to strengthen the link of our research team with the local education offices and other research institutes to further develop the research environments. In addition, we are planning to establish a global STEAM network by student exchanges and conducting a joint research project.

As we start off this project later last year, our primary goal is to construct a basic foundation for the STEAM education system. Several STEAM related courses will be offered for graduate students from fall semester of 2014. Our research team, consisting of scientists, science educators, in-service teachers and graduate students, is in the process of developing STEAM education materials for secondary and tertiary education.

We are looking for researchers who are interested in STEAM education from overseas. We cordially invite the EASE members to collaborate with us to conduct a STEAM education project for nurturing creative human resources for the 21st century society.

Professional Development Programs for STEAM Teachers in Korea

Insik Hahn
Ewha Womans University, Seoul

Over the past three years, we have been organizing professional development programs for STEAM (Science, Technology, Engineering, Arts and Mathematics) teachers at Ewha Womans University. The Ministry of Education and KOFAC (Korea Foundation for the Advancement in Science and Creativity) support financially the PD programs which are implemented by the Advanced STEAM Teacher Education Center (ASTEC) at the College of Education. Many faculty members from various departments design the programs and participate as lecturers and mentors. In each year, about 200 elementary and 200 secondary in-service teachers participate in the PD programs. Since most of the participating teachers have some experience in STEAM education, the primary purpose of our program is to provide more in-depth understanding and advanced instructional skills on STEAM education so that the teachers play a role as proactive STEAM leaders in the teacher community.

The major characteristics of the programs are as follows.

First, we offer different types of lectures on diverse disciplines (e.g. literature, art and design, movie-making, architecture, engineering, history, philosophy, science, and mathematics) in order to encourage the teachers to have a glimpse of and interest in other areas. We offer many lectures which the teachers can select based on their preference and interests. Second, we emphasize practice-based approach because it has been pointed out that not many teachers actually enact what they have learned from teacher workshops in their classrooms. Thus, in our program, we provide opportunities to create STEAM lessons plan with other teachers in group. After taking the PD programs at Ewha, all the teachers are asked to implement STEAM education at their schools for a couple of months and then they come back to Ewha for sharing their experience with other teachers. Third, we open science and engineering laboratories for the teachers because we believe that the teachers should taste new cutting-edge science and technology in order to develop decent STEAM lesson plans. In the laboratories, the teachers in group use computers and instruments to collect data from experiments, and have Q&A sessions with professors and graduate students. Fourth, we adapted on/off blended learning strategy. We construct a website for uploading all the presentation files and video clips of lectures and formulating on-line learning community. Through the website, the teachers are able to take any lectures that they could not take offline, and conduct group works with other teachers. Lastly, we recruit mentors and educate them to help the participating teachers to develop STEAM lessons. Each group of teachers has a mentor who has experienced in developing and implementing STEAM materials. The mentors deliver more practical knowledge on STEAM teaching, and facilitate the group discussions by providing feedbacks and comments.

We have very satisfactory evaluation on our advanced STEAM programs by the participated teachers. They appreciated their experience of various disciplines and research laboratories, and loved to build a community to share their interest and struggles on STEAM education. One noticeable thing was that the topics of the lesson plans produced by the teachers

were very diverse and interesting! We had a poster session in a big room for sharing STEAM ideas, and it was very impressive to see their creativity and artistic sense in designing STEAM lessons.

This year, we start the program from July 29th. We are expecting new groups of enthusiastic teachers on STEAM education!

Never Stop Wondering! Keep Your Passions!

Kisang Kim
Korea Foundation for the Advancement of Science and Creativity, South Korea

I am delighted to introduce my experience at Arizona Science Center in Unites States to EASE members. Since January, I have been working at the Science center through the global training program of KOFAC. While staying at Arizona Science Center, I have aided in several different department, with the main focus in educational services and guest experience department.

Arizona Science Center (ASC) is located in Arizona, which is found in the southwestern region of the Unites States, is called the Grand Canyon State and is famous for its desert climate and Saguaro cactus. The mission of Arizona Science Center is to inspire, educate and entertain people of all ages about science. Its mission can also be found on ASC's splendid slogan, "Never stop wondering", which can be seen throughout the center by all guests.

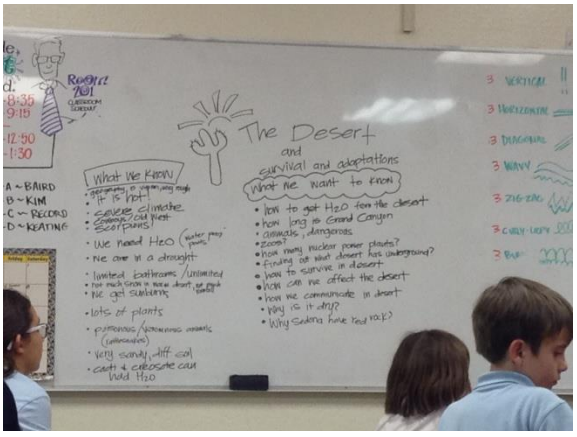
First of all, the most impressive thing is that contrary to most science centers, ASC is run without government support. ASC is not only NPO (non-profit organization) but also NGO (non-governmental organization). ASC runs just their own income and lots of donations. Several companies and people in Arizona willingly donate their money to the science center. Thus allowing the ASC to administrate according to their convictions without outside intervention. Outside of employees, more than 500 people all of various ages and positions; high school students to retired scientists are volunteering at ASC. The volunteers' aid in preparing materials, developing activities, learning programs, doing table-top activities, teaching science classes and so on. Some people and companies are supporting ASC financially, and others offer support

through their abilities. Both options provide the opportunity to aid in raising the children in Arizona with the rest of the community.

Let's see inside the science center. At the Arizona Science Center there are more than 300 hands-on exhibits in the Center's permanent galleries. Special educational programs and science activities are offered for visitors of all ages, which include: daily demonstrations, home school and preschool science programs. 150 unique programs, classes and lectures and a repertoire of 105 gallery demonstrations and table-top activities performed daily on a rotating basis. More than half a million families, educators, students and other guests visited annually(the population of Arizona is around6,553,255; 2013 est.) and enjoyed fun and life-close science experience; desert survival, rattlesnake and cow's organ dissection, heart nutrition and so on.

Onsite one can find; professional development workshops, coaching services for educators and educational leaders also offered through the Center for Leadership in Learning. Focusing on instructional excellence, shared instructional leadership, and parent and community engagement which impacted teachers and students in classrooms across Arizona. During fall, winter, spring and summer STEM camps are available for children between 6 and 12. STEM Club programming, which includes 10 weeks of after-school, inquiry based learning supports specific grade level and state science standards. In this manner, as Arizona Science Center is covering all ages, positions and offers various type of science experience across Arizona, the Center plays a key role of science education of Arizona and shows a genuine free-choice learning place. And visitors are shown that are really engaged with and enjoy science.

This experience at Arizona Science Center makes me think about science education and administration of science learning institute anew. I hope I can do more encouraging children's interest and engaging people with science upon this experience.



Science Education Special Interest Groups in Taiwan

Hsin-Yi Chang
National Kaohsiung Normal University

There are several regularly held Special Interest Group (SIG) meetings for science education in Taiwan. These SIGs were initiated by and are participated in voluntarily by science education researchers. In this article two recent activities related to the focus of education technology in science education from two SIGs are introduced.

DR. HSIN-KAI WU gave a talk on the needs and visions of digital learning from the perspective of science education in the 2014 Special Interest Groups Workshop on Science of Digital Learning on June 14th in Tainan, Taiwan. Dr. Wu is Research Chair Professor at the Graduate Institute of Science Education, National Taiwan Normal University, Taipei. Her research interests include chemistry education, scientific modeling, learning technologies, and inquiry learning. She received the Outstanding Dissertation Award from the National Association for Research in Science Teaching (NARST) in 2003, and the Early Career Award from NARST again in 2008. She has also received the Wu Da-Yu Memorial Award and Outstanding Research Award from the Ministry of Science and Technology, Taiwan.

In her talk, Dr. Wu highlighted science education standards in *Taking Science to School* (National Research Council [NRC], 2007), *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas* (NRC, 2012), and *Next Generation Science Standards* (NRC, 2013). Addressing the participants' interest in the area of digital learning, she discussed how technology plays a role in relation to the standards. The science education standards stress the importance of engaging students in scientific practices to develop conceptual understanding, higher-order thinking skills and inquiry competence. She raised the question of how to integrate modern technology in science class to benefit student learning in light of the conceptual, motivational, cognitive, metacognitive, individual and social development of learners, to spur the participants' discussion and future collaboration. The participants included about 50 faculty members from universities across all regions of Taiwan whose research expertise and interests are in digital learning at all education levels. This well-received talk was ended by Dr. Wu envisioning innovative technology possible for science education in the future.

The Special Interest Group on Educational Technology in Science Education

This SIG is led by DR. CHIN-CHUNG TSAI. Dr. Tsai is Chair Professor at the Graduate Institute of Digital Learning and Education, National Taiwan University of Science and Technology, Taipei. He is Co-Editor of Computers & Education, and has received many research awards including Outstanding Research Awards from the Ministry of Science and Technology, Taiwan, and he received the 51st Ministry of Education Academic Award from the Ministry of Education, Taiwan in 2007. He initiated this SIG in 2008 to form a community of science education researchers whose interests lie in educational technology for substantial research envisioning and collaboration. A total of 20-25 faculty members from universities across Taiwan participate in this SIG which has met about once a month since then. These researchers have gathered to conduct literature reviews and theoretical and empirical research on technology integration in science education reform.

As a result of this SIG collaboration, the members have published five journal articles (listed at the end of this article). In Chen et al. (2012), they proposed a framework for interdisciplinary experts who have interest in designing and evaluating technology-integrated laboratories to consider essential aspects including inquiry learning and openness supported by technology, ways of conducting laboratories, and the diverse learning objectives on which a technology-integrated laboratory may be focused. In Lai et al. (2013) the authors reviewed 113 studies to investigate how eye-tracking technology has been applied to studies of learning and found solid evidence that eye-tracking technology promotes innovative research methods for educational researchers to connect learning outcomes to cognitive processes. In Lee et al. (2011), the authors examined 65 papers on Internet-based science learning and found potential gender difference and the importance of learner control and teacher support. In Wang et al. (2014), the authors synthesized 42 studies to delineate how these studies incorporated various types of modern technology to support different phases of school science laboratories. They found that incorporation of technologies in school science

laboratories has changed students' learning experiences in terms of the phenomena to be explored, their interactions with the natural phenomena or materials, and approaches to handling and making sense of data. In Wu et al. (2013) the authors reviewed intervention studies that addressed technology-assisted instruction from 2005 to 2010 and found that most the studies focused on higher education and the subject areas of science and engineering during that time period.

The SIG continues to meet and the participants are now extending their interest to research on participants' perceptions of technology integrated school science laboratories. They are currently developing framework and instruments, and actually collecting data to further understand issues in this area of research.

For details of their research, please refer to the following articles:

- Chen, S., Lo, H.-C., Lin, J.-W., Liang, J.-C., Chang, H.-Y., Huang, F.-K., Chiou, G.-L., Wu, Y.-T., Lee, S. W.-Y., Wu, H.-K., Wang, C.-Y., & Tsai, C.-C. (2012). Development and implications of technology in reform-based physics laboratories. *Physical Review Special Topics-Physics Education Research*, 8, 020113-1-12.
- Lai, M.-L., Tsai, M.-J., Yang, F.-Y., Hsu, C.-Y., Liu, T.-C., Lee, S. W.-Y., Lee, M.-H., Chiou, G.-L., Liang, J.-C., & Tsai, C.-C. (2013). A review of using eye-tracking technology in exploring learning from 2000 to 2012. *Educational Research Review*, 10, 90-115.
- Lee, S. W. -Y., Tsai, C. -C., Wu, Y. -T., Tsai, M. -J., Liu, T. -C., Hwang, F. -K., Lai, C. -H., Liang, J. -C., Wu, H. -C. & Chang, C. -Y. (2011). Internet-based science learning: A review of journal publications. *International Journal of Science Education*, 33 (14), 1893-1925.
- Wang, C.-Y., Wu, H.-K., Lee, S. W.-Y., Hwang, F.-K., Chang, H.-Y., Wu, Y.-T., Chiou, G.-L., Chen, S., Liang, J.-C., Lin, J.-W., Lo, H.-C., & Tsai, C.-C. (2014). A review of research on technology-assisted school science laboratories. *Educational Technology & Society*, 17(2), 307-320.
- Wu, Y.-T., Hou, H.-T., Hwang, F.-K., Lee, M.-H., Lai, C.-H., Chiou, G,-L., Lee, S. W.-Y., Hsu, Y.-C., Liang, J.-C., Chen, N.-S., & Tsai, C.-C. (2013). A review of intervention studies on technology-assisted instruction from 2005-2010. *Educational Technology & Society*, 16 (3), 191–203.

Sharing Experiences of Attending NARST Annual Conference in Pittsburgh

Eunhang Lee, Hyunok Lee, Jiyeong Mun, Yoonsook Chung & Yeonjoo Ko

Ewha Womans University, South Korea

NARST Annual International Conference was held in Pittsburgh on March 30-April 2, 2014. Five Ewha graduate students participated in the conference and presented their research. Some of them made their first trip to NARST. Let's share their experiences at NARST 2014 with EASE members!

< Eunhang's story>

At first I had no idea about how to apply for attending the conference. I thought that it is my last chance to take part in the conference as a doctoral student, so I strived to write my proposal on August. Fortunately I got the email from NATST that my proposal was accepted. I was very excited.

When I arrived at the conference, I was glad to meet famous scholars. Especially I was so happy to see the scholars who had been visited my university. Moreover each session of the conference was interesting and I could know that how and what kinds of research in science education were studied through other people's presentations. I also took part in the program for graduated students, so I could get some useful information to study like the way to apply for a scholarship and make friends. It was really a good time.

Actually I was nervous, because it was my first presentation at the NARST conference. Before my presentation I couldn't ease tensions all the time, but professors encouraged me. During my presentation the audience listened carefully and some audience showed interest in my research. Through this opportunity to present at the conference, I felt a sense of belonging and realized responsibility as a community member of science education. It was a good experience to grow for me.

I had a chance to nourish myself, attending the NARST conference. I will never forget this precious memory and I will

try to participate in the conference again. I look forward to meeting many scholars and friends in science education at 2015 NARST Annual International Conference.

< Hyunok's story>

The most fun part about research for me is sharing and developing ideas with other scholars. Conferences are the place to enjoy all of these. Pittsburgh in 2014 was the second time I had participated in a NASRT conference, and from my first experience the previous year, I felt good to know my work was appreciated and I realized my identity as a researcher. I spent quite a long time during my flight to Pittsburgh thinking about a "second" meaning of participating in the conference. Above all, I could make a goal to do a better presentation. That was important but it was not sufficient. My second goal could be communicating and making new friends. Actually, it was not something for me to pursue and complete, but to try and find enjoyment. In spite of linguistic difficulties, I met several fascinating people and made what I judge to be new friends. Obviously, it was awkward to start conversation with a stranger, but it was exciting to talk to a person who has the same interests as me. I figured out someone had similar interests with me because I had encountered them in several sessions, and some of them had novel ideas which were apparent in their questions and what I overheard. After some hesitation, I said "Hello" to them. It was a pleasant surprise to find the right person to talk to, and conversation topics grew deeper and more varied. I also got an opportunity to have a deeper conversation with acquaintances I had made last year. On the last day of the conference, I had great dinner with new and old friends. Conversation flowed freely from research issues to daily life.

<Jiyeong's story>

This conference is very special for me because first oral presentation is spoken, so I was getting edgy as the presentation date gets nearer. Also, I was expected to widen knowledge, acquire the chance of academic inspiration, and encounter celebrated scholars knowing through various international conferences and global programs. I spent about 16 hours by flight for participating in the NARST conference in Pittsburgh airport at 30th March. When I arrived at the hotel which the conference held, the nightscape is very beautiful due to the city view on the hill.

This is the third time I attended the NARST conference, and I learned a lot of things every time. There were many scholars and graduate students who preparing their presentation, just like me. Always, a lot of people to attend this conference and lots of presentations held in the same time, so I remain regret to

miss several presentations. I was most impressed by many researchers who preparing their presentation before the session in the lobby, even well-known scholars. It stimulated preparing my presentation in the last day.

My presentation was scheduled on the last session and the last day, so there were few people in the session. Although I did my presentation without any mistakes, this presentation remain lots of regrets for me. That of because I want to discuss my presentation with many researchers who related with my subject field. Maybe, in the next presentation, I can do the expectation.

Our team attended the luncheon award (banquet). We had a great time with delicious foods, discussion of researches, and celebrating the scholars who prize winners. Overall, I felt that attending the NARST conference really helps me a lot.

<Yoonsook's story>

I can say for certain sure that it was indeed a wonderful experience for me to participate in NARST conference. Attending NARST conference is quite special. It is really exciting thing to meet lots of famous scholars whose name are frequently referred on the journal articles. I had a chance to introduce myself to them. They also gave me valuable comments to elaborate my research idea. It was really meaningful place for academic exchange.

Sometimes, conference that is held in faraway country from Asia encourage chance meeting. I met EASE friends at NARST. Two of my group members who were attended EASE summer school on 2012 also participated in NARST conference. They lived in China, so I could not see them for a long time. We spent some time not only sharing our study once again but also catching up each other. I am really proud of my EASE friends. We are actively working to broaden boundary.

Participating NARST conference is good chance to trip USA. Every year, NARST conference held in different city. The venue for 2013 NARST conference was Puerto Rico, and Pittsburgh for this year. What an interesting experience it is! Just participating NARST conference I can visit several great places of USA. Maybe I cannot forget the moment looking down Pittsburgh with my adviser. The scenery was really beautiful and the time was meaningful. I am already fluttering with new expectation to visit Chicago next year.

Above this, participating NARST conference remains as a good memory. You can get travel scholarship for international students offered by NARST if you needed. You can join social group for graduate students or early carrier scholar. You can receive special care from other participants if you participate in NARST conference for the first time. Why are you hesitant to attend NARST conference? We will experience more than whatever you can imagine. The proposal due is August 15. Hurry up. I hope to see you at next NARST conference.

<Yeonjoo's story>

Every year, more than a thousand science educators and graduate students gather in one place for NARST. I had been looking forward to attending one of the best conferences in the field of science education NARST, and it was great honor to give my first oral presentation in this international conference. That's why I didn't feel any fatigue after I arrived

in Pittsburgh even though it took more than 15 hours from Seoul. I was so excited that I was participating in NARST.

When I attended the keynote speech and the award luncheon with my advisor and colleagues, there were so many people around the world not limited to the Americans – there were also several dozens of Koreans. I hadn't seen that much huge conference before! I saw a lot of distinguished scholars and met some of them who had visited my university Ewha to give lectures or attend the EASE winter school. It was great to keep in contact with them through the conference. Above all, the most impressive thing was that a Korean scholar Dr. Soonhye Park won the NARST outstanding paper award which is given annually for the greatest significance and potential in the field of science education. It was so fantastic! I was so proud to be a Korean.

My oral presentation session was assigned to the very last session of the very last day, and I was the last presenter of my session. If I had an oral presentation earlier, I might feel much comfortable during the conference. I was so nervous that I could do well on the presentation during the whole conference days. Every night, I practiced to speak slowly and pronounce clearly so that my words can be understood by audiences and also tried to emphasize the important points to explain what I expected to convey to the audiences. This preparation time increased my confidence and allowed me to feel more relaxed and sure that everything would work on the day.

Despite the experiences of standing on the stage or having a presentation in front of hundreds of people many times, I couldn't handle my anxiety waiting for my turn in the session. My advisor encouraged me to have confidence on the presentation with holding my hand for a while, and this warm encouragement was really helpful for me to relieve my nervousness. There are not many audiences in the room because it was the end of the conference, but they cordially welcomed me. I tried to enjoy my presentation to be seemed it was a kind of performance. Fortunately, some of them showed their interests and gave good comments on my first research, and a scholar recommended me an article helpful for developing my research. It was a great opportunity for me to introduce my research findings and share ideas with the scholars and graduate students around the world.

This experience stimulated me to keep up my research and to study hard in order to participate in NARST again! I believed that this conference participation will serve as an effective motivator for me to tackle the next research hurdle.

Meeting Korea

Igal Galili
Science Teaching Center in The Hebrew University Jerusalem

I was lucky to be invited to lecture at the First Asian Regional Conference of History and Philosophy in science education in Seoul National University in October 2012. Before, I never was in Korea and so was happy to come. My meeting with people of Korea was so pleasing that I kept thinking how I come back again. Living in Israel, about 12 hours of direct flight from Seoul, may explain my late acquaintance with Korea besides my general knowledge about the special history of your people and the fact that at home, I drive Hyundai car. So when my Sabbatical year came in 2013-14, I wrote to the people I met before in Seoul National University, Professor Jinwoong Song and Professor Gyoungho Lee, asking their readiness to host me again for a stay in 2014. I was happy when they agreed and so I could come again to Korea.

Thinking about the way I can contribute the people whom I deeply sympathize I looked for a possible bridge which may connect me with your people who possess a very different culture from that I belong, grew up, lived and worked through my life. So many things were different: meal, language, people's behavior, cultural traditions, religion, climate…

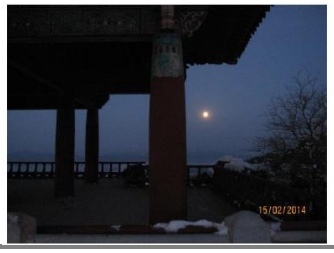
But there was something in common that I observe looking at our peoples and countries and it was very important – the passionate dream of national independence which became reality and a struggle for surviving in the situation when one can rely ultimately on the greatest effort and sacrifice of your own people, the readiness to perform, endless hard work and defend yourself at any cost. The other important similarity was the attitude to knowledge and learning. Our people share the attitude of greatest respect, ascribing the highest value to learning and knowledge. Given that, I intended to share with you the perspective to scientific knowledge that I believe possesses strong potential for education. Within it, the scientific knowledge itself is considered to be a culture rather than a discipline as commonly practiced in learning science at higher level of education: high school and university. Being cultural, the knowledge includes different perspectives on the same subject; it reveals the constructing scientific discourse to the learner. Why I think it is important and feasible for me to do in Korea?

First of all, the culture of science lacking any national identity and pursuing the universal values such as the objective knowledge about nature, its laws and organization may bridge between peoples no matter how different their national cultures are. I believe, this is a special mission of science in establishing better life and better future for all people.

But there was also another role of the cultural approach that I saw as important for being introduced in science curriculum in schools. In present time, science and science education, as a part of social functioning, the contemporary life of societies in many countries, become highly pragmatic, seeking immediate practical applications and the clear material benefits of science. This is a new (less than a hundred years) trend which though is easily understandable, in certain sense contradict the fundamentals of science which led the leading scientists through 2500 years that science progress, as we know it. Science education became highly oriented to technology and teaching science became focused mainly on problem solving. Science education tries to be as close as possible to technology and so standard problem solving came to the fore, often pushing aside the discourse of ideas, the big picture of scientific account of nature. Even if we all understand the need for practicalities we should not forget that the usefulness of science draws on its progress, constructing of new knowledge. This process is not restricted to solving standard problems but rather involves complex process which goes on through an intensive discussion of ideas and various attempts to understand and account for natural phenomena. It is difficult to expect the students who were trained and instructed to master precise rules and procedures will be successful in producing new ideas, new conceptions, new ways of problem solving and new knowledge (even if the students work very-very hard). For that, it is learning and teaching rather than training and instruction are appropriate. They should reveal to the learners the culture of scientific discourse; familiarize them with variety of ideas which led to the currently adopted scientific truth already in school curriculum.

Such ideas I tried to depict in my lectures that I gave in Seoul National University. I was very pleased with my interactions with colleagues and students who asked for clarifications and suggested their understanding of this important subject which might renovate the current science curriculum.

One experience during this time, that I especially appreciate, was the meeting with Professor Sung-Jae Pak whom I know for years, meeting him at international conferences of science education research. Professor Pak was so kind to organize and lead a very special tour − Exploring Science Culture at Gyeongju where the UNESCO world heritages are. These two days were so pleasing and enriching for me that I will remember them for a long time. This experience well matched with my own orientation in science education. I felt this also when we visited the local school and observed nice students' projects in science classes. Finally, we observed together a full Moon continuously transformed to observing the spectacular sun rising. All these were near Seokgulam Grotto – a very impressive cultural monument incorporating a giant Buda statue from the past and which involves several interesting scientific aspects discovered recently. This experience was so special that I would recommend to all students to have it at least once.



I left Korea with a great feeling that my world was enlarged with a part of special beauty that I hope to see again. Till then, Shalom and the best wishes for your prosperity and success.

New Journal Asia-Pacific Science Education

Jinwoong Song, Editor-in-Chief
Sonya Martin & Nam-Hwa Kang, Co-Editors
Young-Shin Park, International Coordinator

Asia-Pacific Science Education (APSE) publishes papers examining on-going educational issues associated with science learning and teaching in the Asia-Pacific region as well as research involving Asian students and teacher populations in other areas of the world. APSE seeks to provide researchers in the Asia-Pacific region with a central channel for disseminating research about issues in science education in Asia to both the regional and international research community.

***APSE's* scope** is broad in both methodology and content and we accept research conducted at all levels, including early childhood, primary, secondary, tertiary, workplace, and informal learning as they relate to science education. The Editorial Board invites scholarly manuscripts employing various methodological approaches, including qualitative research designs (e.g. ethnography, narratives, case studies, historical/philosophical approaches, etc.) as well as quantitative research designs (e.g. quasi-experimental design, correlation study, hierarchical linear model, etc.). APSE also publishes theoretical papers, position papers, and critical reviews of literature on emerging issues in the field of science education in Asia-Pacific region.

APSE will operate as an Open Access (OA) online journal using a continuous publication model where articles are made available immediately. The Journal will be published in English and an abstract written in the author's native language will be also featured with the article. Springer publishes APSE in collaboration with KASE (Korean Association for Science Education).

♣ Call for papers

The debut issue of APSE is anticipated to appear in summer 2014. The Editorial Board invites researchers to submit original article-length manuscripts (not exceeding 10,000 words including references and single-spaced). Detailed expectations for manuscript preparation and submission will be accessible via the Instructions for Authors section of our soon to be launched website.

♣ How to submit Manuscripts

Detailed information about manuscript submission requirements is currently available via E-mail (apse.journal@gmail.com). Manuscript can be submitted at any time for review.

If you have more questions, don't hesitate to contact us apse.journal@gmail.com

Upcoming Conferences

1. Science Education at the Crossroads 2014. Call for Proposals in March 2014, with an anticipated meeting in September 2014. http://www.sciedxroads.org/callpaper.html
2. 11th International Conference of the Learning Sciences. June 23-27, 2014 @ Boulder, Colorado, USA http://www.isls.org/icls2014/
3. 2nd International History, Philosophy and Science Teaching Asian Regional Conference. Dec. 4-7, 2014 @ Taipei, Taiwan.

4. The Thirteenth International History, Philosophy and Science Teaching Conference will take place 22-24 July 2015 at Rio de Janiero, Brazil. http://conference.ihpst.net/
5. The Association for Science Teacher Education 2015 conference will be held 7-10 Jan 2015 in Portland, OR. Conference proposals are generally due in mid July of the preceding year. http://theaste.org/meetings/2015-international-meeting/
6. The European Science Education Research Association will hold its 2015 conference in Helsinki, Finland. http://www.sails-project.eu/portal/event/esera-european-science-education-research-association-conference-2015
7. The 2015 conference will be held February 26-28, 2015 in Grand Rapids, MI. (Submissions are generally due the preceding October.) http://www.msta-mich.org/

2015 EASE Science Education Conference, Date will be announced. @ Beijing, Mainland China

The 2nd Asian Regional IHPST Conference

The second Asian Regional IHPST conference will be held in Taipei, Taiwan, December 4-7, 2014. The Conference Chair is Prof. Dr. Chen-Yung Lin (lcy@ntnu.edu.tw) and the Secretary is Shiang-Yao Liu (liusy@ntnu.edu.tw) both from National Taiwan Normal University.

Conference theme: *Re-examining Science: Historical, Philosophical, and Sociological Approach to Public Engagement with Science.*

The conference will be held at the Howard Civil Service International House, located alongside the university.

Keynote speakers

1. **John Dupré** is Professor of Philosophy of Science and Director of Egenis, the Centre for the Study of Life Sciences, at the University of Exeter.
2. **Mansoor Niaz** is a Professor of science education at the Universidad de Oriente, Venezuela.
3. **Kuang-Tai Hsu** is a professor of history at National Tsing Hua University, Taiwan.
4. **C. Kenneth Waters** is currently the Samuel Russell Chair of he Humanities and Director of the Minnesota Center for Philosophy of Science at the University of Minnesota.
5. **Otávio Bueno** is Professor of Philosophy and Chair of the Philosophy Department at the University of Miami.
6. **Alan Love** is Associate Professor of Philosophy at the University of Minnesota and a member of the Minnesota Center for Philosophy of Science.
7. **Szu-Ting Chen** is a professor in graduate institute of philosophy in National Tsing Hus University, Taiwan.

Important Dates

- Submission system available on 31 March, 2014
- Deadline of submission: 15 July, 2014
- Notification of abstract acceptance: 1 September, 2014
- Early bird registration deadline: 30 September, 2014
- Registration deadline: 15 October, 2014

Registration fee:

		Before September 30	*After September 30*	*On-site (cash only)*
Regular	member	180 USD	220 USD	245 USD
	Non-member	225 USD	265 USD	290 USD
Student		125 USD	155 USD	175 USD

Further information about the conference can be found at: http://www.sec.ntnu.edu.tw/ihpst2014/.

Invitation to contribute to a new book

Gender and Asian Identities in Science Education

Sonya N. Martin

Seoul National University, Republic of Korea

We are proposing a new book focusing on gender issues in science education with a focus on issues in Asia and/or issues faced by Asian students or teachers in other geographic locations. We are sending out an invitation to authors at various stages of their careers and with varied research interests to contribute to our book. The book will be published in the book series ***Routlege Critical Studies in Asian Education***.

For more information about this series, please visit http://www.nie.edu.sg/research-publications/routledge-critical-studies-asian-education.

Currently we are finalizing the book proposal and soliciting potential book chapter contributions. We would like invited authors to critically engage with issues and problems that Asian women and girls confront in science education, including issues faced in both formal and informal science settings, science-related policies, etc. Authors are encouraged to adopt a range of genres, methodologies, and theoretical lenses in their writing and to engage theoretical constructs from curriculum studies, feminist studies, queer theory, sociology, anthropology, cultural studies, etc.

Below are some proposed themes and topics to consider for your chapter.

Theme 1: Asian Women and Girls in Science and Science Education

This section will include chapters paying tribute to female scientists and science educators who have been inspirational to other women in science and science education. The chapters may be in the form of biographies, autobiographies, or articles featuring interviews with scholars who have made great contributions to the development of science education.

Theme 2: Confronting reality

This section will include chapters that take a critical stance to problematize topics and issues about gender and science or science education, with a particular focus on intersections with race and ethnicity. For example, the authors may question studies that show trends of female enrollment in science-related higher degree programs, but that fail to address variations in data based on race, ethnicity, social class, religion, language, or sexuality, or they may examine typical research on the gendered nature of science curriculum texts (e.g., textbooks and YouTube videos, such as those on reproduction) or constructs used to distinguish differences between females and males, but do so with the added lens of race and ethnicity. In addition, theoretical constructs such as *othering*, *marginalization*, *bordering*, *sexuality*, *power*, *diaspora*, and *entry* versus *entr é* may be discussed in relation to various gender equity issues.

Theme 3: Subjectivity and gendered science

This section will include chapters that use theoretical constructs such as *identity*, *positionality*, *standpoint*, and *subjectivity* to examine how these embodiments are enacted in the performativity of women and girls in science settings. Of particular importance for these chapters would be an integrative focus on women's experiences in conjunction with differing intersecting identities, including race, ethnicity, class, religion, language, etc.

Theme 4: Gendered politics

This section will include chapters that discuss how broader policy decisions and changes result in the gendered nature of science and science education. For example, what sorts of funding (e.g., for research or scholarships) and opportunities are available to promote efforts toward more women in science-related fields in higher education and careers? What types of inclusive science education policies or gender equity initiatives have been implemented and what are some impacts on women's or girls' status in science? Authors may choose to take a historical perspective to examine trends at macro-,

meso- or micro-levels to make sense of different groups of women's experiences in science education in different contexts.

Theme 5: Feminist methodologies

This section will include chapters that discuss gender-sensitive/responsive/adaptive research methodologies that can better enhance our understanding of the complex situation that Asian women and girls confront in their pursuit to learn science. In these chapters, authors would be encouraged to consider methodologies that would be responsive to Asian women's and girls' needs and that would allow researchers to elicit a better understanding of the ways in which Asian females experience science. For example, authors could examine power-relationship differentials between researchers and the researched in an effort to develop methodologies that better reflect the needs and concerns of women and girls with complex intersecting identities.

Theme 6: Re-envisioning science for greater solidarity

This section will include chapters that discuss and suggest future efforts to re-center women and girls in the science domain. For example, authors may explore strategies to empower Asian women and girls to participate as authentic and full members of science, or they may suggest broad initiatives or movements in science education that can help to heighten the status and presence of Asian women and girls. In addition, authors may suggest future gender studies of Asian women and girls in science education.

Prepare and submit a proposal by Sept 1, 2014

Proposals should include:

- A descriptive title
- A brief abstract about your idea (approximately 250-400 words) and the theme you want to address
- An author biography (including names, institution affiliations, email addresses, and brief descriptions of position and research for each author).
- Send proposal as a Word file (.doc/.docx).

Submit Proposals via email to

Dr. Tang Wee Yeo **tangwee.teo@nie.edu.sg** and
Dr. Sonya N. Martin **sonya.n.martin@gmail.com**

Proposals will be reviewed and notification of acceptance will be sent to authors by October 31, 2014.

Proposed timeline for book production (Aug 2014–Sept 2016)

Chapters should be approximately 3,000-3,500 words long (including tables, figures, and references). A chapter template will be provided for you if your proposal is accepted.

Submission of chapter: August 31, 2015

Reviews and revisions: Nov 2015-June 2016

Submission of final chapter: September 2016

If you have any questions, please do not hesitate to email us.

Prof. Tang Wee Teo

National Institute of Education
Nanyang Technological University, Singapore

http://www.nie.edu.sg/profile/teo-tang-wee
Email: tangwee.teo@nie.edu.sg

Prof. Sonya N. Martin

Earth Science Edu Dept., College of Education
Seoul National University, Republic of Korea

https://rcssse.squarespace.com/sonyanmartin/
Email: sonya.n.martin@gmail.com

Book Review

Developing Assessments for the Next Generation Science Standards

Assessments, understood as tools for tracking what and how well students have learned, play a critical role in the classroom. Developing Assessments for the Next Generation Science Standards develops an approach to science assessment to meet the vision of science education for the future as it has been elaborated in A Framework for K-12 Science Education (Framework) and Next Generation Science Standards (NGSS). These documents are brand new and the changes they call for are barely under way, but the new assessments will be needed as soon as states and districts begin the process of implementing the NGSS and changing their approach to science education.

For more information about this book, please visit the website at http://www.nap.edu/catalog.php?record_id=18409. (Free E-book can be downloaded.)

EXECUTIVE MEMBERS OF EASE

Editors of the EASE Newsletter

Issues to be in charge	Responsible editor	Region
Jun., 2014	Prof. Hyunju Lee (hlee25@ewha.ac.kr)	Korea
Sep., 2014	Prof. Shiho Miyake (miyake@mail.kobe-c.ac.jp)	Japan
Dec., 2014	Prof. Hsin-Yi CHANG (hsinyichang@nknucc.nknu.edu.tw)	Taiwan
Mar., 2015	Prof. So, Wing Mui Winnie (wiso@ied.edu.hk)	Hong Kong