



the 13th International Conference on Technology Education in the Asia-Pacific Region: shaping a sustainable future

Technology Education in each country exists to help develop students' technological literacy and success in a technologically driven world.

The 13th International Conference on Technology Education (ICTE) in the Asia-Pacific Region was held in January of 2019 at the Korea National University of Education in Cheongju, South Korea. With Dr. Sangbong Yi as a chairperson, the Korean Technology Education Association organized this international conference.

The ICTE is a biennial event bringing professionals in the field of Technology Education together, offering them an

opportunity discuss research findings and exchange ideas. Known by other subject descriptors such as Engineering Education, Design and Technology, STEM and/or Industrial Education, all persons interested in Technology Education were encouraged to participate. Korea hosted the 13th ICTE Conference. Table 1 identifies the years, venues, and hosts of all 13 conferences.

by
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Given the impact that technology has on all aspects of human society, the 2019 conference theme was "Technology Education: A Way to Make Global Education Innovative and Sustainable." ICTE Korea 2019 offered researchers and educators from institutions in the Asia-Pacific region and around the globe an opportunity to exchange ideas, address critical issues, and discuss future developments in the field of technology education. For additional information, access the ICTE Korea 2019 website at www.ictekorea.org/?act=info.page&pcode=sub1_1.

A total of 170 participants from eight different countries attended the three-day conference. Ten globally renowned, scholarly technology educators took part as keynote and invited speakers. Many other technology education professionals, ranging from students, current teachers, and national education leaders, participated. Participant presentations focused on three separate strands:

1. Elementary Technology Education
2. Curriculum and Facility for Secondary Technology Education

3. Instructional Design and/or Method and Assessment of Technology Education at the Secondary Level

Participants shared information concerning students, teachers, and technology education curriculum from their countries. The information provided varied perspectives and insights, offering a global view of Technology Education. Dr. Hee-Chan Lew, President, Korea National University of Education, welcomed participating technology educators to the conference. Dr. Lew expressed the importance of technology education and congratulated those present for their participation.

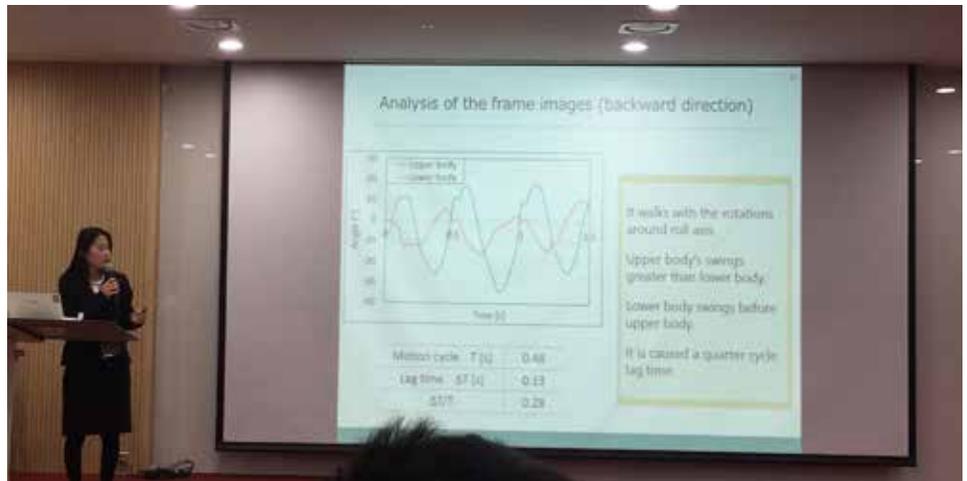
As the conference title suggests, presentations focused on how technology education provides a means to "make global education innovative and sustainable." Keynote speaker and ITEEA Past President, Dr. Edward Reeve (U.S.), opened the conference with "STEM Education: Essential in Preparing the Next Generation of Learners." Keynote speaker Dr. Lung-Sheng (Steven) Lee (Taiwan) presented the "Status and Challenges of Technology Education as an Integral Part of Generation Education in Taiwan." Keynote speaker, Dr. P. John Williams (Australia), opened the second day with "Opportunities and Threats for Technology Education" and Dr. Mark de Vries (The Netherlands) was the final keynoter, presenting "The Global Status of and Challenges for Technology Education as an Integral part of General Education." As these titles suggest, Technology Education professionals around the globe face similar issues and opportunities. All four keynote sessions were well attended, with questions and comments at the end of each.

Presenters from eight nations provided 56 separate presentations focusing on many different research topics, as evidenced by a review of presentation titles. One would find that the focus of eleven presentations were related to Design. Seven presentations discussed MakerSpace programs and activities. Presenters

| Round (Year) | Venue | Host |
|--------------|---------------------------|--|
| 1 (1995) | Otsu, Japan | The Japanese Society of Technology Education |
| 2 (1997) | Taipei, Taiwan | Chinese Industrial Arts Education Association |
| 3 (2000) | Canberra, Australia | Australian Council for Education through Technology |
| 4 (2001) | Daejeon, South Korea | Korean Technology Education Association |
| 5 (2003) | Auckland, New Zealand | Technology Education New Zealand |
| 6 (2006) | Hong Kong, China | Hong Kong Technology Education Association |
| 7 (2007) | San Antonio, Texas, USA | International Technology and Engineering Education Association |
| 8 (2009) | Taipei, Taiwan | Taiwan Industrial Technology Education Association |
| 9 (2011) | Aichi, Japan | The Japanese Society of Technology Education |
| 10 (2013) | Nanjing, China | Nanjing Normal University |
| 11 (2015) | Hong Kong, China | Hong Kong Technology Education Association |
| 12 (2017) | Christchurch, New Zealand | Technology Education New Zealand |

Figure 1. ICTE Asia-Pacific Region Conference: Years, Venues, and Hosts

offered four presentations that focused on two subjects: assessing students' attitudes and viewpoints and programming in the classroom. Various other presentations discussed areas such as invention education, using laser cutters and 3D printing, and curriculum design. Three presentations provided graphic illustrations of the mathematics used to design and build walking paper robots and lock boxes. One presentation identified crafting small marionettes to communicate with students with special needs. Delving beyond the presentation titles, one will find that many studies and presentations were related. To identify every presentation and their topics is beyond the bounds of this article. The findings and presentation of every research study, however, is equally important.



Japan presentation.

Although only four presentation titles contained the acronyms STEM (2) and STEAM (2), those teaching, learning, and assessment methods were found in at least 12 presentations. This could imply that the technology education profession has gone beyond simply identifying STEM/STEAM programs and now discusses the use and benefits of those methods of teaching and learning occurring in classrooms. Seven presentations focused on design, three concerning making and MakerSpaces in education. Common words and themes, such as "invention" and "problem solving" occur in each of these presentations. The results of lessons and activities focusing on students' imagination and creativity are revealed in these presentations.

Five separate presentations identified studies concerning students' attitudes and viewpoints. One study researched the attitudes of students when studying historical and social aspects of technology. This included working with students with special needs. Two presentations identified that students possessed a lack of interest in technology education. A lack of interest could be a reason for the findings of a separate research and presentation, that students generally have negative attitudes towards technicians and their work. The results of one study identified that there was no significant difference between elementary boys and girls concerning their interest in invention and problem solving.

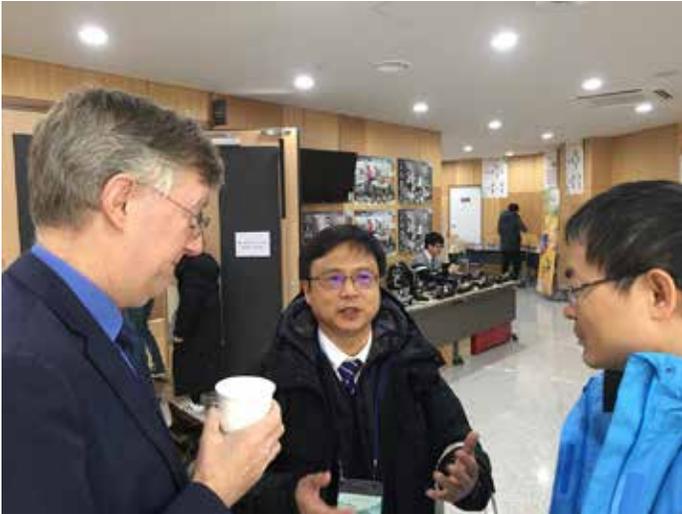
Another interesting point revealed during the conference was that technology education curriculum in at least three countries—Korea, Taiwan, and Hong Kong—have recently been revised. This point identifies the changing nature of technology education in the Asia-Pacific Region. It is a point that nations of other parts of the world should realize. The results and findings of studies

such as these presented at the 2019 ICTE Conference address the ever-changing face and nature of technology and technology education.

Twenty-two researchers displayed poster exhibitions reporting case study research findings. These exhibitions focused on areas such as curriculum development, students using smartphones supporting school life, and artificial intelligence versus human job interviews. Exhibitions were supported with oral presentations. The posters remained in place for the duration of the conference. The exhibitions provided conference attendees with information concerning current technology and engineering research recently conducted in the Asia-Pacific region.

In addition to presentations and research poster exhibitions, the ICTE conference offered four tours providing a multidimensional view of Korean culture and industry. The tour to the Cheongju National Museum presented a view of Korea's cultural heritage through different historical periods. On the second day, participants enjoyed the Korean Educational Tour at the Korea National University of Education Museum. The museum displayed authentic Korean educational artifacts, including centuries-old





curriculum and textbooks. Four three visited the HYUNDAI Motor Company, Asan Plant. Presenting Korean innovative robotics manufacturing technology, the tour involved a walk-through where participants could see the entire automobile manufacturing process. The final tour provided a wonderful example of Korean Culture, a Buddhist temple stay at the Beopjusa Temple, a World Heritage Center tucked away in the beautiful mountains of central Korea. These tours afforded participants an excellent view of Korean history and culture, enhancing participants' experience in relation to technology education.

No matter where one resides on planet Earth, society faces radical transition. The fourth Industrial Revolution includes Artificial Intelligence, Drone Technology, Smart Manufacturing, and Autonomous Vehicles as examples of future technologies already in use. Accordingly, systems of education must provide the instruction and human resources necessary to face the dramatic changes influenced by these state-of-the-art technologies. Technology education plays an important role in teaching students how to understand and use technologies. Therefore, technology educators, experienced and new, must realize that change is upon us. Before adequate teaching and learning can occur, educators need to understand the opportunities and challenges of technological advances. Once realized, technology educators will be in position to propose the direction of education, both general and technology-related.

The 13th ICTE Asia-Pacific Region conference in Cheongju, Korea brought together educators from around the world to discuss success stories as well as identify issues facing education systems in individual countries. Seasoned educators brought historical perspectives and experiences, while young educators furnished the enthusiasm and energy necessary for education to progress into the future. Together, all educators identified problems, suggested remedies, and discussed the need for continued research in technology and STEM education.

The conference was a great success. Quantitatively, a higher number of attendees participated than in the previous conference in 2017. Qualitatively, technology education research findings and presentations promoted enthusiastic discussion. Forging future actions, the conference provided attendees with an opportunity to share success stories as well as identify challenges facing technology education around the world. One thing is certain: technology education in each country exists to help develop students' technological literacy and success in a technologically driven world.

The 14th ICTE will be held at the Taiwan Normal University in Taipei, Taiwan in 2021. Please consider attending this wonderful experience designed to enhance the future of technology education on a global level. The conference will provide a chance to share ideas, discuss creativity, and present networking opportunities for those who have interest and enthusiasm in technology education.



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