Let's GO Tech to Pursue Sustainability and Happiness

Lung-Sheng Lee

National United University

Paper presented at Kisarazu National College of Technology (Kisarazu Kosen), Japan,

April 26, 2012

Author Note

Dr. Lung-Sheng Lee is president and professor of business management at National United University (NUU) in Maioli, Taiwan (2005-), as well as faculty of the Department of Technology Application and Human Resource Development at National Taiwan Normal University (NTNU) in Taipei, Taiwan (1984-). He also serves as ambassador of International Center of Taiwan, International Technology and Engineering Educators Association (ITEEA, USA) (1997-) and president of Association for Cross-cultural Training (ACT, Taiwan) (2012-). He is grateful to the Kisarazu National College of Technology (Kisarazu Kosen) for its warm friendship and inviting him to make this presentation at Kisarazu Kosen. Correspondence concerning this article should contact Lung-Sheng Lee at lslee@nuu.edu.tw.

Abstract

Technology refers to making or doing things to extend human capability to meet our needs or wants. Both technology and engineering are closely related. The majority of faculty and students in both Kisarazu National College of Technology (Kisarazu Kosen or KNCT) and National United University (NUU) are in the field of engineering. Based upon a literature review and this author's understandings, this paper first introduces the STEM education promoted in the United States and argues the vital role of Technology and Engineering (T&E), then introduces the GO Tech promoted at NUU. GO Tech stands for both "Green Technology" and "Orange Technology." This author mainly argues that the students in both Japan and Taiwan need STEM education and should value the "T and E" in STEM, and states that "GO Tech" means "We should cherish the opportunity to learn "T and E" and value both green and orange technologies." This author also wishes that more cooperation between Kisarazu Kosen and NUU is promoted to obtain positive synergies to help students' learning and pursue human sustainability and happiness.

Keywords: gerontechnology, green technology, orange technology, STEM

Let's GO Tech to Pursue Sustainability and Happiness

We Need STEM Education and Should Value the "T and E" in STEM

Generally speaking, technology refers to making or doing things to extend human capability to meet our needs or wants. Technology involves objects, knowledge, activities, processes and systems, which range from very simple ones to very complex ones (Bilton, n.d.). Using hot water to open jar lids as well as inventing a mobile phone to extend human speaking and hearing capabilities are two examples of technology. Engineering is defined as "the application of scientific and mathematical principles to practical ends such as the design, manufacture, and operation of efficient and economical structures, machines, processes, and systems" (Society of Women Engineers. n.d.).

In the real world, the four disciplines—Science, Technology, Engineering and Mathematics (STEM) —are closely connected. In order to compete economically with other nations in the future, the United States has increased its investment in science and technology research and STEM education from kindergarten to post-graduate education. Morrison (2006, pp. 2-3) suggested the following eight attributes of the STEM educated student:

1. Problem-solvers—be able to frame problems as puzzles and then able to apply understanding and learning to these novel situations;

2. Innovators—be able to hold power to pursue independent and original investigation using the design process;

3. Inventors—be able to recognize the needs of the world and creatively design and implement solutions;

4. Self-reliant—be able to set own agendas, develop and gain self-confidence and work within

time specified time frames;

5. Logical thinkers—be able to use the logic offered by calculus and found in 60% of all professions world-wide, as well as and able to make the kinds of connections to affect an understanding of natural phenomena;

6. Technologically literate—be able to understand the nature of the technology, master the skills needed and apply it appropriately;

7. Be able to participate in the STEM lexicon that supports the bridge between STEM education in school and the workplace; and

8. Be able to relate their own culture and history to their education.

According to the report "Good Jobs Now and for the Future", by the U.S. Department of Commerce's Economics and Statistics Administration, STEM workers drive USA's innovation and competitiveness by generating new ideas, new companies and new industries. The following information is shown in the report (Langdon, McKittrick, Beede, Khan, & Doms, 2011, p. 1):

1. In 2010, there were 7.6 million STEM workers in the United States, representing about 1 in 18 workers;

2. STEM occupations are projected to grow by 17.0 percent from 2008 to 2018, compared to 9.8 percent growth for non-STEM occupations;

3. STEM workers command higher wages, earning 26 percent more than their non-STEM counterparts;

4. More than two-thirds of STEM workers have at least a college degree, compared to less than one-third of non-STEM workers; and

5. STEM degree holders enjoy higher earnings, regardless of whether they work in STEM or non-STEM occupations.

It is believed that STEM workers in either Japan or Taiwan also play a key role in the sustainable growth and stability of economy, and are a critical component to helping the nation win the future. However, in most countries, Technology and engineering (T&E) are often the forgotten part of the STEM education for primary and secondary students (Walton, 2012).

Technology and engineering are two intertwined terms and two disciplines centered on problem-solving. Technology deals with the same topics as engineering, but in more unstructured problems and with more applications. In every production, T&E are at the front and play decisive roles. Thus, T&E constitute the primary productive force. It is vital that we need STEM education and should not overlook the "T and E" in STEM.

"GO Tech" Means That We Should Cherish the Opportunity to Learn "T and E" and Value Both Green and Orange Technologies

In recent years, National United University (NUU), in which about 70% of the faculty and students are in the fields of engineering, chose Green and Orange Technologies (GO Tech) to be its distinguishing feature for preparing the professionals and conducting academic research. In mandarin Chinese, the pronunciation of "Green and Orange"（橘綠）is similar to "吉利" (*jili*, means "auspicious"), so NUU has devoted to auspicious technologies.

While green technology (green-tech) values sustainable development, orange is the color of sunshine and represents warmth. Thus, orange technology (orange-tech) symbolizes care technology, which concerns about the welfare of elderly people, minority groups and all people by means of technologies. NUU believes that the promotion of auspicious technologies enhances human sustainability and happiness.

Recently, the National Science Council (NSC) of Taiwan announced a call for proposal in the fields of green technology and orange technology. In the call-for-proposal, green

technology is defined as the technology which focuses on environment-friendly and sustainable development design that concerns about the reduction of negative impacts on the environment, environmental conservation, energy-saving and carbon-reduction during its overall production life cycle. Orange technology centers around the care of people, which develops the technological products or services related to human welfare and health care. The main customers of these products or services are the disadvantaged who need long-term or special care such as the elderly, children, the disabled and the new immigrants. The dignity of the individual and the emphasis on warm, thoughtful and safety principles should be concerned when designing the products or services.

For example, the design regarding orange technology of Jia-Weih Ding, a NUU alumnus, just won an iF concept design award 2012, which is one of the most prestigious design competitions in the world. The idea of his awarded innovative toilet, which is portable and has a pair of handles to help its users to stand up, origins from the experience of his right leg injured in a car accident when studying at NUU. The toilet has been designed to meet the needs of the elderly and arthritis patients in particular.

That is to say, at NUU we chose "GO Tech" to encourage our students to cherish the opportunity of learning Technology and Engineering (T&E), to be employed in the field of T&E, and to value both green and orange technologies. What a coincidence that Kisarazu Kosen has also promoted environmental technology and gerontechnology. Therefore, this author would like to encourage the students at Kisarazu Kosen to cherish the opportunity to learn "T and E" and value both green and orange technologies. It is also wished that more cooperation is made between Kisarazu Kosen and NUU to obtain positive synergies to pursue human sustainability and happiness.

References

Bilton, J. (n.d.). *What is technology?* The UK Technology Education Centre. Retrieved from

http://atschool.eduweb.co.uk/trinity/watistec.html

Langdon, D, McKittrick, G., Beede, D., Khan, B, & Doms, M. (2011, July). *STEM: Good jobs*

now and for the future (Executive Summary). U.S. Department of Commerce

Economics and Statistics Administration.

Morrison, J. S. (2006, August). *Attributes of STEM education*. TIES STEM Education

Monograph Series.

Society of Women Engineers. (n.d.). *What is engineering?* Retrieved from

http://www.swe.org/regionE/OpeningEngineering/what_is_engineering.htm

Walton, M. (2012, February 2). Technology and engineering, the forgotten part of STEM

education. *CNN's Schools of Thought*. Retrieved from

http://schoolsofthought.blogs.cnn.com/2012/02/02/my-view-technology-and-engineering-

the-forgotten-part-of-stem-education/