

# Challenges and Opportunities Facing Technology Education in Taiwan

**Lung-Sheng Steven Lee**

President, National United University;  
Professor, Department of Technology Application and Human Resource Development,  
National Taiwan Normal University

**Abstract:** The technology education in Taiwan is prescribed in the national curriculum and provided to all students in grades 1-12. However, it faces the following challenges: (1) Lack of worthy image, (2) Inadequate teachers in elementary schools, (3) Deficient teaching vitality in secondary schools, and (4) Diluted technology teacher education programs. In order to create opportunities for the survival and prosperity of technology education in Taiwan, the following efforts should be made: (1) Embrace technology education in country-wide further-study examinations, (2) Initiate an international comparison of students' technological literacy, and (3) Make well preparation for the next national curriculum revision.

## Introduction

Considered as “utilizing abundant resources and making useful things”, technology is highly valued in Taiwan. Technology education in Taiwan is categorized into the following two types: (1) technological specialty education—the education for specific people to become technicians and professionals in technology-related jobs; and (2) technological literacy education—the education for all people to become technological literates. This paper describes various challenges and opportunities facing technological literacy education in Taiwan.

The present education structure in Taiwan supports 22 years of formal study. Completion times are flexible, depending upon the needs of students. Normally, the entire process consists of 2 years of optional preschool education, 9 years of compulsory education (6 years of primary school plus 3 years of junior high school), 3 years of senior high school, 4-7 years of college or university, 1-4 years of a master's degree program, and 2-7 years of a doctoral degree program (Ministry of Education, 2008). The goal of technology education in elementary, junior high school and senior high school is to assist students to develop the ability to be aware of, explore, understand, use and manage technology in order to adapt to current and future technological society. The technology education for all students in grades 1-12 is mainly implemented through Living Technology (LT) course or sub-learning-area, prescribed in the national curriculum in Taiwan that all students are required to learn. As shown in Figure 1, LT is embedded in the “Life” learning area in grades 1-2 as well as in the Natural Science and Living Technology (NS&LT) learning area in grades 3-9, respectively; and a stand-alone course in grades 10-12.

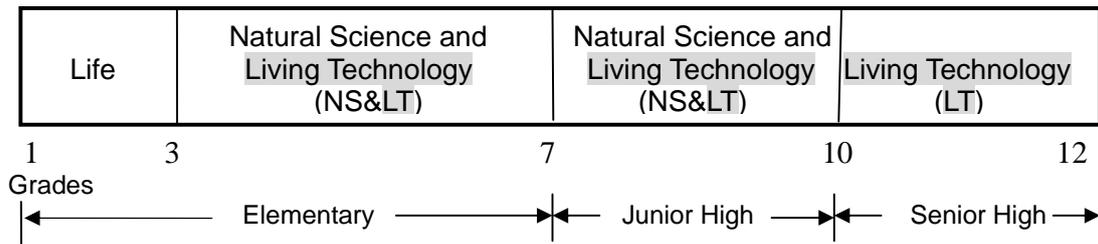


Figure 1. LT is defined as a sub-learning-area or a stand-alone course in national curriculum

In grades 1 – 9, the learning area of NS&LT is implemented based on competence indicators. Its technology part focuses on the integrative ability of the following aspects: food, material, mechanical application, electricity and its application, information and information communication, residence, transportation, the exploitation and utilization of energy, originality and fabrication, as well as technological civilization. In senior high school (grades 10-12), LT includes a core/required subject “Technology and Life” (2 semester credits) and an advanced/optional subject (2-4 semester credits) which consist of the following five themes: Communication Technology, Construction Technology, Manufacturing Technology, Transportation Technology, as well as Energy and Power. All students have to take 2-6 semester credits among them.

### Challenges

Technology education in Taiwan spans through all grades, but it faces the following challenges (Lee, 2001):

#### 1. Lack of worthy image

Technology education in Taiwan is not included as one of the subjects in the entrance examination for students’ further study at the upper-secondary school or college/university level. When criticizing the effectiveness of school courses, mainland Chinese like to say “No examination, no teaching; no teaching, no learning.” Many Taiwanese also mock those courses which are not in the entrance examination as subordinate courses. Unfortunately, Technology education in Taiwan is a “subordinate course” and lacks of worthy image.

#### 2. Inadequate teachers in elementary schools

Technology education became a new sub-learning-area in 2001 due to the implementation of Grades 1-9 National Curriculum. Most in-service teachers did not receive technology teacher education. Therefore technology education at the elementary school level is still not widely accepted.

#### 3. Deficient teaching vitality in secondary schools

When most students in both secondary schools spend their time for preparing further study entrance examinations, technology education teachers feel difficult to receive well support from school administrators, peer teachers and student parents. Thus, deficient teaching vitality is found in secondary schools, especially in junior high schools in which technology education is often “swallowed” by science education.

#### 4. Diluted technology teacher education programs

Since the 1990's, more and more universities have been allowed to offer teacher education programs. In this open structure, traditional teacher training universities and colleges have to broaden their missions, and their established departments which prepare technology teachers start to offer programs other than teacher training. For example, specialized technology and human resource development (HRD) programs are added to meet the industry and corporation requirements. The program diversification of established departments of technology teacher education results in the dilution of their technology teacher training and related research and development.

### **Opportunities**

There is a fable as follows. A chicken and a cow were chatting with each other on a farm. The chicken expressed that Kentucky Fried Chicken (KFC) is the place a chicken fears the most because KFC advertises "We do chicken right" and the cow felt that McDonald is the one a cow is most afraid of. Then, they wondered what people fear the most. Finally, they concluded that people are most afraid of no opportunity to access KFC and McDonald.

Due to the challenges described earlier, technology education professionals must make some efforts to create the opportunities for the survival and prosperity of technology education. At least, the following efforts should be made:

1. Embrace technology education in country-wide further study examinations

At the lower-secondary level, both NS and LT are in the umbrella of NS&LT learning area and the NS part has been in the upper-secondary entrance examination. Technology education professionals in Taiwan should take actions to persuade the education authority to embrace LT in the upper-secondary entrance examination first, then in the collegiate entrance examination.

2. Initiate an international comparison of students' technological literacy

International comparison in both PISA (Programme for International Student Assessment) and TIMSS (Trends in International Mathematics and Science Study) draws much attention of many countries and the school subjects related to PISA and TIMSS are highly valued. International technology education professionals should work together to add technology education to existing international comparisons such as PISA or create a new one.

3. Make well preparation for the next national curriculum revision

More and more emerging issues are suggested to be added to school curriculum and national curriculum is like an arena of various subjects. For example, the professionals of information and communication (ICT) in Taiwan have worked hard to develop content standards of ICT and lobby the value of ICT education. Technology education professionals in Taiwan should fasten their pace to make well preparation for the next national curriculum revision.

### **References**

- Lee, L. S. (2001). *Technology education in Taiwan*. Retrieved August 1, 2009, from [http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content\\_storage\\_01/0000019b/80/16/3f/c2.pdf](http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/16/3f/c2.pdf).

Lee, L. S. (2009, November 11-12). *Challenges and opportunities facing technology education in Taiwan*. Proceedings of the International Conference on Technology Education in Asian and Pacific Region (ICTE 2009) (pp. 78-81). National Taiwan Normal University, Taiwan.

Ministry of Education. (2008, December 3). *The educational system*. Retrieved August 1, 2009, from <http://english.education.edu.tw/ct.asp?xItem=4133&CtNode=2348&mp=12>.