DOCUMENT RESUME

ED 414 506 CE 075 495

AUTHOR	Lee, Lung-Sheng
TITLE	A Comparison of Technology Education Programs in Eight Asia-Pacific Countries.
PUB DATE	1998-01-00
NOTE	10p.; Paper presented at the National Conference of the Australian Council for Education through Technology (Melbourne, Victoria, Australia, January 4-9, 1998).
PUB TYPE	Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Comparative Analysis; Comparative Education; *Educational Development; Foreign Countries; Job Skills; Job Training; Problem Solving; *Program Content; *Program Implementation; *Technology Education
IDENTIFIERS	*Asia Pacific Region

ABSTRACT

To improve technology education in Taiwan and promote understanding of international technology education, technology education programs in Australia, Japan, Korea, Mainland China, Malaysia, New Zealand, the Philippines, and Taiwan were compared. A four-stage comparative approach (description, interpretation, juxtaposition, comparison) was used. Four main aspects of technology education programs were compared: the macro context, educational context, status quo, and features. These conclusions were drawn: (1) technology education was commonly seen as a subordinate subject; (2) the earliest programs were started at the beginning of this century; (3) the evolution of technology education progressed from handicrafts to technology; (4) program content was related to industry-based knowledge and in some countries linked with agriculture- and/or business-based knowledge; (5) based on their goals and contents, programs could be categorized into four types: life fulfillment, industrial skill development, pre-vocational education, and design/problem solving; (6) countries faced these common problems in technology education implementation--lack of qualified teachers and adequate equipment, insufficient financial support and teaching hours, and out-of-date curricula; and (7) the major trend was an emphasis on a praxis-based body of knowledge. All eight countries had good potential to foster technology education provided there would be effective professional supervision. (YLB)

Running head: COMPARATIVE TECHNOLOGY EDUCATION

A Comparison of Technology Education Programs in Eight Asia-Pacific Countries

Lung-Sheng Lee
National Taiwan Normal University

Paper presented at
the Australian Council for Education Through Technology (ACET),
National Conference "Technology Education: The Way Forward,"
Melbourne, Victoria, Australia
January 4-9, 1998

Abstract

In order to find ways to improve technology education (called "industrial arts" or "design and technology" elsewhere) in Taiwan and promote our understanding of international technology education, this study compared technology education in the following eight countries: Australia, Japan, Korea, Mainland China, Malaysia, New Zealand, the Philippines, and Taiwan. G. Z. F. Beready's four-stage comparative approach (description-interpretation-juxtaposition-comparison) was utilized, and the following four main aspects of technology education programs in the eight countries were compared: the macro context, educational context, status quo and features. The following conclusions were drawn: (1) Technology education is commonly seen as a subordinate subject. (2) The earliest technology education programs were started at the beginning of this century. (3) The evolution of technology education programs progressed from handicrafts to technology. (4) The contents of technology education in all countries are related to industry-based knowledge and those in some countries are also linked with agriculture- and/or business-based knowledge. (5) Based on their goals and contents, technology education programs in the eight countries can be roughly categorized into four types: life fulfillment, industrial skill development, pre-vocational education, and design/problem solving. (6) The common problems faced by these countries in the implementation of technology education are a lack of qualified teachers and adequate equipment, insufficient financial support and teaching hours, and out-of-date curricula. (7) The major trend in technology education programs is an emphasis on a praxis-based body of knowledge. Along with the seven other countries, Taiwan has good potential to foster technology education provided that there is effective professional supervision.

Introduction and Purpose

As one of the six "Asian Dragons" or Dynamic Asian Economies (DAEs) along with Hong Kong, Malaysia, Singapore, South Korea and Thailand, the Republic of China on Taiwan (henceforth, called Taiwan) is often praised for its economic prosperity and political democratization. Through hard work and a willingness to learn, the people of Taiwan hope to turn the island into a technological island serving as an Asia-Pacific regional operation hub.

Technology education in Taiwan is mainly covered by the elementary-school subject of craftwork, and the secondary-school subject of industrial arts/living technology[1]. National curriculum standards for these technology education subjects are determined and promulgated by the Ministry of Education (MOE). The curriculum standard is normally revised approximately every 10 years.

In order to find ways to improve technology education in Taiwan and promote our understanding of international technology education, technology educators in

Taiwan should investigate technology education programs in their neighborhood countries. Therefore, a comparison of the technology education programs in eight countries--Australia, Japan, Korea, Mainland China, Malaysia, New Zealand, the Philippines, and Taiwan--was completed in a study project (henceforth, called this study) in the year 1996-1997.

Conceptual Bases and Significance of This Study

A technology education program can not be separated from its macro and educational contexts, and should center around curriculum. As shown in Figure 1, the main themes compared in this study were as follows:

1. Macro context—political, economical and social background.
2. Educational context—schooling system.
3. Status quo—centering around current official/formal/written curricula of technology education in public elementary and secondary schools, and including supporting resources such as teacher quality and textbook policies. In detail, the following components related to technology education curricula in the eight countries were explored and compared: evolution, structure, development model, and supporting resources.
4. Features—major characteristics, problems and trends in technology education curricula.

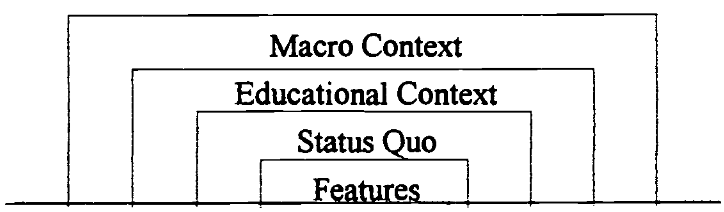

Figure 1. Main themes compared in this study.

No cross-country comparative study in technology education similar to this study had been completed previously. Through this study, the following benefits were obtained: (1) Technology educators in Taiwan worked together to fulfill the purpose of this study--to find ideas for improving technology education in Taiwan and to promote our understanding of international technology education. (2) Research associates, mainly graduate students, were practically trained. (3) Interim results were discussed at the 1997 International Conference on Technology Education in the Asia-Pacific Region (ICTE'97). ICTE'97 was held in Taipei, Taiwan, April 23-26, 1997. Conference participants were from eight countries or entities in the Pacific rim: Australia, Hong Kong, Japan, Korea, New Zealand, Thailand, Taiwan, and the U.S.A.[2]

Procedures and Methods

Sponsored by the National Science Council (NSC), this study was divided into seven country-specific sub-projects and one comparative sub-project. According to G. Z. F. Bereday's four-stage comparative methodology (see Figure 2) (Bereday, 1966; Jones, 1973), an area study comprises the first two stages and a comparative study consists of all four stages. Thus, the seven country-specific sub-projects were area studies. The comparative sub-project included an area study on Taiwan and a comparative study on the eight countries, including Taiwan. The tasks involved in that comparative sub-project mainly included: communicating with the NSC, drafting a study agenda, organizing joint meetings, exploring technology education in Taiwan, and conducting a cross-country comparison.

1. **Description** → 2. **Interpretation** → 3. **Juxtaposition** → 4. **Comparison**

|←—— Area Study ——→|

|←———— Comparative Study ————→|

Figure 2. G. Z. F. Bereday's four-stage comparative methodology.

Employing G. Z. F. Bereday's four-stage comparative methodology, country-specific information was collected through literature review, interviews and visitation in each country. In addition, some ICTE'97 participants served as resource persons for this study.

Findings and Conclusions

As a result of this study, eight study reports in Chinese, were completed and submitted to the NSC in 1997. This paper only summarizes the major findings and conclusions as follows:

1. Technology education is commonly seen as a subordinate subject.

   Approximate time allocation for technology education is presented in Table 1. Although all eight countries have offered their pupils technology education programs, it was found that technology education is commonly considered a subordinate subject.

2. The earliest technology education programs started at the beginning of this century.

   It was found that all the eight countries started to offer pupils technology education during this century. Several countries, such as Taiwan and the Philippines, began to offer technology education programs at the beginning of this century, but several countries, such as Australia and New Zealand, began to offer technology education programs in the last two decades.

Table 1.

Approximate Time Allocation for Required and Optional Technology Education Programs in the Eight Countries.

Country	Elementary Level	Lower-Secondary Level	Upper-Secondary Level
Australia	N.A.	N.A.	Optional
Japan	N.A.	2/30	N.A.
Korea	1/31	2/34	Optional
M. China	1/33	2/36	2/40
Malaysia	2/48	4/45	3/42 or 4/43
The Philippines	40/360*	10/50	N.A.
New Zealand	4/30	4/30	Optional
Taiwan	2-3/26	2/37	2/39

Notes: (1) Except for the cell marked with "*", the quantitative unit for each cell is "technology education period (s) per week/total class periods per week." The unit for the marked cells is "technology education class minutes per day/total class minutes per day.

(2) The total number of weekly class periods at each level vary slightly based on the grade.

(3) Technology education may be only a part of a unified subject which also includes home making/home economics, fine arts, etc.

3. The evolution of technology education programs progressed from handicrafts to technology.

   The technology education programs in the eight countries have evolved as follows: handicrafts--craftwork--working--industrial arts--technology. however, several countries which began technology education programs later than others bypassed the early stages.

4 .The contents of technology education in all eight countries are related to industry-based knowledge, and those in some countries are also linked with agriculture- and business-based knowledge.

   As shown in Table 2, all the technology education programs in the eight countries are linked with industry-based knowledge and those in some countries, such as Japan, Korea, and Mainland China, are also related to agriculture- and/or business-based knowledge.

Table 2.

Curricular Goal, Major Contents, and Main Characteristics of Technology Education Programs in the Eight Countries.

Country	Curricular Goal	Major Contents	Main Characteristics
Australia	To acquire a body of technological knowledge	Focuses on design/problem-solving.	Integrates theory with practice
Japan	To meet daily life needs	Covers agricultural and industrial skills.	Focuses on daily life and productive skills
Korea	To develop industrial skills	Covers aspects of industry, agriculture, home economics and computers at the elementary level; Includes aspects of industry, agriculture, business, fishing etc. at the lower-secondary level; adopts American-style technological body of knowledge categorized into the areas of manufacturing, construction, information, communication, energy and transportation.	Focuses on preparing students for jobs
Mainland China	To meet daily life needs	Covers aspects of agriculture, industry, and home making; Includes the following four technical areas: household living, equipment maintenance, productive technology and techniques for raising plants and animals.	Focuses on preparing students for jobs
Malaysia	To learn industry- and business-related skills	Covers aspects of industry, business, home economics and agriculture.	Focuses on preparing students for jobs

Table 2 (continued)

Country	Curricular Goal	Major Contents	Main Characteristics
New Zealand	To meet daily life needs	Focused on acquiring technological thinking skills.	Focuses on technological impact on society
The Philippines	To learn industry- and business-related skills	Covers domestic handicrafts, industrial skills and technological knowledge.	Focuses on preparing students for jobs
Taiwan	To develop industrial skills	Focused on visual arts at the elementary level; covers the fields of material-processing and several broad areas of industry.	Focuses on daily life and career exploration

5. Based on their goals and contents, technology education programs in the eight countries can be roughly categorized into four types: life-fulfillment, industrial skill development, pre-vocational education, and design/problem solving.
   As shown in Table 2, the technology education programs in the eight countries can be roughly categorized into the following four types: (1) life-fulfillment—mainly Japan and somewhat Mainland China; (2) industrial skill development—mainly Korea and Taiwan; (3) pre-vocational education--mainly Malaysia and the Philippines; and (4) design/problem solving--mainly Australia and New Zealand.
6. The common problems faced by these countries in the implementation of technology education are a lack of qualified teachers and adequate equipment, insufficient financial support and teaching hours, and out-of-date curricula.
   The lack of qualified teachers and adequate equipment, insufficient financial support and teaching hours, and out-of-date curricula were found the common problems faced by these countries in the implementation of technology education programs.
7. The major trend in technology education programs is the focus on a praxis-based body of knowledge.
   Technology education programs in several countries, such as mainland China, tend to be vocational education, and those in several countries, including Taiwan, are obviously within the realm of general education. It is found that the major trend in technology education programs in the eight countries is the focus

on a praxis-based body of knowledge. That is, the knowledge body of technology education is becoming more and more systematic.

Implications

As a result of this study, at least the following two implications can be drawn:

1. More dialogue should be encouraged among Asia-Pacific regional technology educators.

   This study found that there is little communications among Asia-Pacific regional technology educators. More dialogue should be encouraged in the future.

2. Taiwan has good potential to foster technology education provided that there is effective professional supervision.

   Along with the other seven countries, Taiwan, where technology education programs are moving from industrial arts to living technology (Lee, 1997), has good potential to foster technology education provided that there is effective professional supervision.

Finally, it should be pointed out that due to the many difficulties encountered in most cross-country comparative studies (Crossley & Broadfoot, 1992), the results of this study may be oversimplified or flawed. However, a further comparative study on technology teacher qualifications and teacher education programs in five of the eight countries is being conducted. As a result of this further study, our understanding of technology education programs in the five countries will be improved.

References

Bereday, G. Z. F. (1966). Comparative method in education. New York: Holt, Rinehart and Winston.

Crossley, M., & Broadfoot, P. (1992). Comparative and international research in education: Scope, problems and potential. British Educational Research Journal, 18(2), 99-112.

Jones, P. E. (1973). Comparative education: Purpose and method (Reprinted). St. Lucia, Queensland: University of Queensland Press.

Lee, L. S. (1997). Moving from industrial arts to living technology: The status of technology education in Taiwan, R.O.C. Paper presented at the 1997 International Conference on Technology Education in the Asia-Pacific Region (ICTE'97), Taipei, Taiwan, April 23-26.

Author Note

Dr. Lung-Sheng Lee is a professor and the Department Chair of the Department of Industrial Technology Education at National Taiwan Normal University (NTNU), the secretary-general of the Chinese Industrial Arts Education Association (CIAEA), Taiwan, R.O.C., and an adviser of the Science and Technology Advisory Office, Ministry of Education (MOE), R.O.C. As the general director of the joint study

project described in this paper, he is indebted to the project sponsor, the National Science Council (NSC), Executive Yuan, R.O.C., his research associate Ms. Ying-Wen Wang, seven country-specific sub-project directors and their research associates for the valuable contributions they made to this project (NSC 85-2745-H-003-004R).

Correspondence concerning this paper should be addressed to Lung-Sheng Lee, Department of Industrial Technology Education, National Taiwan Normal University, 162 Hoping E. Rd., Sec. 1, Taipei 106, Taiwan, R.O.C. Electronic mail may be sent via the Internet to t83006@cc.ntnu.edu.tw.

Footnotes

[1]At the junior-high-school level, technology education was changed to "living technology" from "industrial arts" during the 1997 school year while at the senior-high-school level, it is still called "industrial arts" but which may be called "living technology" within a few years (Lee, 1997). Technology education in Taiwan as described in this study is based on "industrial arts."

[2]During the conference, the Constitution of the International Conference on Technology Education in the Asia-Pacific Region (ICTE) was signed by representatives from the following seven technology education associations or societies: Japanese Society of Technology Education (JSTE), Japan; Technology Education New Zealand, New Zealand; Korean Institute of Industrial Educators (KIIE), Republic of Korea; Chinese Industrial Arts Education Association (CIAEA), Taiwan, R.O.C.; Technology Education Federation of Australia (TEFA), Australia; International Technology Education Association (ITEA), U.S.A.; Hong Kong Association for Design and Technology, Hong Kong. According to this Constitution, ICTE is a professional group which normally holds a biennial conference to promote communication and academic exchange. ICTE'99 will be organized by the KIIE and held in Korea in 1999.

CE075 995

A

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
Educational Resources Information Center (ERIC)

ERIC®

REPRODUCTION RELEASE
(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title: A Comparison of Technology Education Programs in Eight Asia-Pacific Countries

Author(s): Lung-Sheng Lee

Corporate Source: National Taiwan Normal University

Publication Date: January 4-9, '98

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, *Resources in Education* (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic/optical media, and sold through the ERIC Document Reproduction Service (EDRS) or other ERIC vendors. Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following two options and sign at the bottom of the page.

☑ Check here
For Level 1 Release:
Permitting reproduction in microfiche (4" x 6" film) or other ERIC archival media (e.g., electronic or optical) *and* paper copy.

The sample sticker shown below will be affixed to all **Level 1** documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Level 1

The sample sticker shown below will be affixed to all **Level 2** documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN OTHER THAN PAPER COPY HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Level 2

☐ Check here
For Level 2 Release:
Permitting reproduction in microfiche (4" x 6" film) or other ERIC archival media (e.g., electronic or optical), but *not* in paper copy.

Documents will be processed as indicated provided reproduction quality permits. If permission to reproduce is granted, but neither box is checked, documents will be processed at **Level 1**.

"I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche or electronic/optical media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries."

Sign here→ please

Signature: Lung-Sheng Lee

Printed Name/Position/Title: Lung-Sheng Lee
Professor & Department Chair

Organization/Address:
Department of Industrial Technology Education
National Taiwan Normal University
162 Hoping E Rd, Sec 1
Taipei 106, Taiwan, R.O.C.

Telephone: +886-2-2321-3664

FAX: +886-2-2392-1015

E-Mail Address: t83006@cc.ntnu.edu.tw

Date: January 20, 1998

(over)

III. DOCUMENT AVAILABILITY INFORMATION (FROM NON-ERIC SOURCE):

If permission to reproduce is not granted to ERIC, *or*, if you wish ERIC to cite the availability of the document from another source, please provide the following information regarding the availability of the document. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents that cannot be made available through EDRS.)

Publisher/Distributor:
Address:
Price:

IV. REFERRAL OF ERIC TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER:

If the right to grant reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Name:
Address:

V. WHERE TO SEND THIS FORM:

Send this form to the following ERIC Clearinghouse:

Associate Director for Database Development
ERIC Clearinghouse on Adult, Career, and Vocational Education
Center on Education and Training for Employment
1900 Kenny Road
Columbus, OH 43210-1090

However, if solicited by the ERIC Facility, or if making an unsolicited contribution to ERIC, return this form (and the document being contributed) to: