DOCUMENT RESUME

ED 416 382 CE 075 852

AUTHOR Lee, Lung-Sheng
TITLE Four Little Dragons' Technology Education.
PUB DATE 1998-03-00
NOTE 14p.; Paper presented at the Annual Conference of the International Technology Education Association (60th, Fort Worth, TX, March 8-10, 1998).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Comparative Analysis; *Educational Practices; *Educational Trends; Foreign Countries; Information Technology; *National Curriculum; Program Implementation; Secondary Education; *Technology Education
IDENTIFIERS *Asia (Southeast); Hong Kong; Singapore; South Korea; Taiwan

ABSTRACT

Secondary-level technology programs in Hong Kong, Singapore, South Korea, and Taiwan (also known as the "Four Little Dragons") were compared by using a methodology incorporating four stages: description, interpretation, juxtaposition, and comparison. It was discovered that, in all four countries, technology education is required for all students in the lower secondary grades (grades 7-9) and offered on an elective basis to students in the upper secondary grades (grades 10-12). A trend toward increasing incorporation of information technology into technology education was noted in all four countries. Emphasis on higher-order thinking skills and the role of problem solving in the design process also appeared to be increasing in all four countries. Among the common problems faced by all four countries in the implementation of technology education were the following: lack of qualified teachers and adequate equipment; insufficient financial support and teaching hours; and out-of-date curricula. More dialogue among technology educators from Hong Kong, Singapore, South Korea, and Taiwan is necessary. All four countries' chances of fostering technology education are good provided they engage in ongoing and systematic curriculum development and effective professional supervision. (MN)

Running head: COMPARATIVE TECHNOLOGY EDUCATION

Four Little Dragons' Technology Education

Lung-Sheng Lee
National Taiwan Normal University

Paper presented at
the International Technology Education Association (ITEA) 60th Annual Conference
Fort Worth, Texas, U.S.A.
March 8-10, 1998

Abstract

In order to promote our understanding of international technology education (also called industrial arts, design and technology, etc.) and find ways to improve technology education in the Republic of China on Taiwan (henceforth, called Taiwan), this study compared secondary-school-level technology education in the following Asian "Four Little Dragons"--Hong Kong, Singapore, South Korea, and Taiwan. G. Z. F. Bereday's four-stage comparative approach (description-interpretation-juxtaposition-comparison) was utilized, and the following four main aspects of technology education programs in the four countries/entities were compared: the macro context, educational context, status quo and features. The following conclusions were drawn: (1) Technology education is prescribed in the national curriculum. (2) Information technology is increasingly being incorporated into technology education. (3) The major trend in technology education programs is the focus on the design process. (4) Some common problems faced by the Four Little Dragons in the implementation of technology education. Along with the other three Little Dragons, Taiwan has good potential to foster technology education provided that there is ongoing and systematic curriculum development as well as effective professional supervision.

Introduction and Purpose

In oriental cultures, the dragon is an imaginary animal representing power and good fortune. For example, the Chinese[1] societies in Hong Kong, mainland China, Singapore, Taiwan, etc. have used 12 terrestrial branches in their lunar calendar for a long time. The 12 terrestrial branches are represented by 12 animals of the Chinese zodiac in the following order: rat, ox, tiger, hare, dragon, snake, horse, sheep, monkey, rooster, dog, and pig. The year of the dragon comes every 12 years, such as 1976, 1988, and 2000. Many Chinese people like their children to be born in the year of the dragon. This leads to the fact that the birth rate increases in each year of the dragon.

Along with Hong Kong, Singapore, and South Korea, Taiwan is known as one of the Asian Four Little Dragons (or Four Dragons of East Asia), which are well-known for their high rates of economical growth. 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 operations hub. Also affected by Asia's financial crisis, Taiwan's financial and economic health has been quite good so far. For example, at the beginning of 1998, Taiwan leads a grouping of 12 Asian countries/entities in the quality of its macroeconomic policy-making (Central News Agency, 1998).

In order to promote our understanding of international technology education and find ways to improve technology education in Taiwan, technology educators in Taiwan should investigate technology education in Taiwan's neighboring countries.

Thus, a comparison of the secondary-school-level technology education programs in the four little dragons (henceforth, called this comparison) was completed and is reported in this paper.

Conceptual Framework of This Comparison

A technology education program may not be separated from its macro and educational contexts, and should center around a curriculum. As shown in Figure 1, the main program themes compared are 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 secondary schools.
4. Features—major characteristics, problems and trends in technology education curricula.

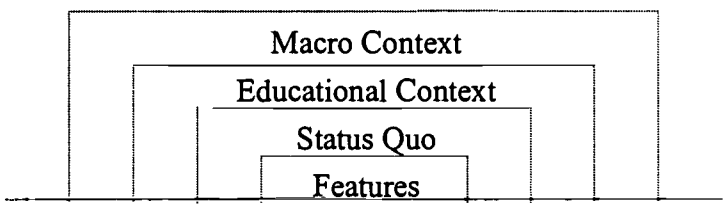


Figure 1. Main program themes compared.

Procedures and Methods

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, this comparison was composed of four country-specific area studies which led to a comparative study.

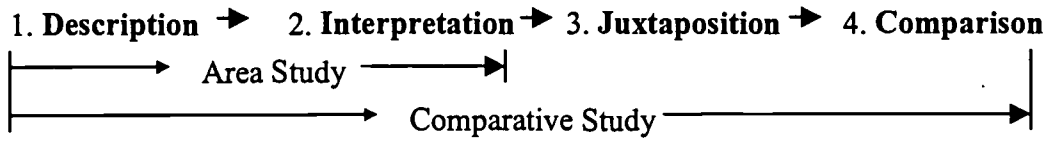


Figure 2. G. Z. F. Bereday's four-stage comparative methodology.

Employing G. Z. F. Bereday's four-stage comparative methodology, country-specific information was collected through literature review, interviews and visitation. In addition, the 1997 International Conference on Technology Education in the Asia-Pacific Region (ICTE'97)[2] was held in Taipei, Taiwan, April 23-26, 1997. Some of the ICTE'97 participants served as resource persons for this comparison.

Findings and Conclusions

A comparison of the basic data of the Four Little Dragons is presented in Table 1.

A comparison of the structures the formal primary- and secondary-education systems in the Four Little Dragons is shown in Figure 3 and briefly introduced following Fig. 3.

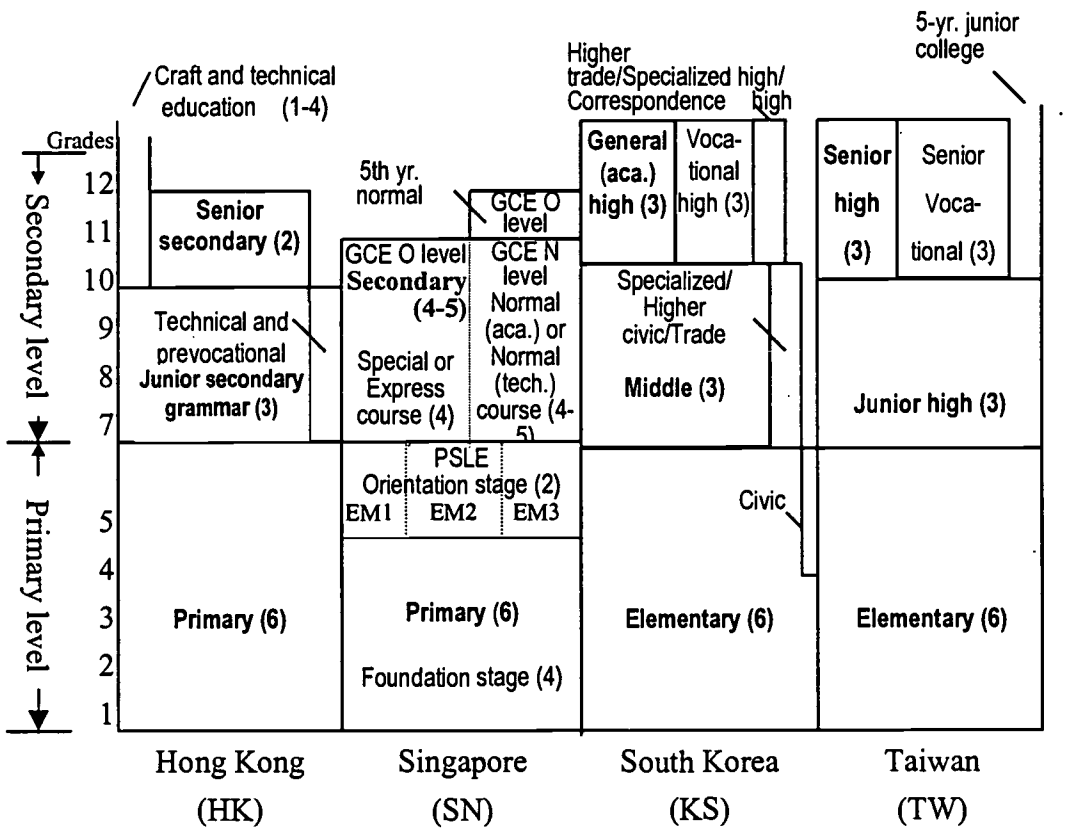
Table 1. A Comparison of the Four Little Dragons' Basic Data.

	Hong Kong (HK)	Singapore (SN)	South Korea (KS)	Taiwan (TW)
Location	22 15N, 114 10 E--East Asia, bordering the South China Sea and China	1 22 N, 103 48 E--Southeast Asia, islands between Malaysia and Indonesia	37 00 N, 127 30 E--East Asia, southern half of Korean Peninsula bordering the Sea of Japan and the Yellow Sea, south of North Korea	23 30 N, 121 00 E--East Asia, islands bordering the East China Sea, Philippine Sea, South China Sea, and Taiwan Strait, north of the Philippines, off the southeastern coast of China
Map references	Southeast Asia	Southeast Asia	Asia	Southeast Asia
Area	1,040 sq. km (six times the size of Washington, DC)	632.6 sq. km (slightly more than three times the size of Washington, DC)	98,480 sq. km (slightly larger than Indiana)	35,980 sq. km (slightly smaller than Maryland and Delaware combined)
Climate	tropical monsoon; cool and humid in winter, hot and rainy from spring through summer, warm and sunny in fall	tropical; hot, humid, rainy; no pronounced rainy or dry seasons; thunderstorms occur on 40% of all days (67% of days in April)	temperate, with rainfull heavier in summer than winter	tropical; marine; rainy season during southwest monsoon(June to August); cloudiness is persistent and extensive all year
Population (July 1996 est.)	6,305,413	3,396,924	45,482,291	21,465,881
GDP real growth rate (1995 est.)	5%	8.9%	9%	6%

Table 1. (continued)

	Hong Kong (HK)	Singapore (SN)	South Korea (KS)	Taiwan (TW)
GDP per capita (1995 est.)	$27,500	$22,900	$13,000	$13,510
GDP composition by sector (1991 est.)	agriculture: 0.2%, industry: 18.4%, services: 81.4%	agriculture: NEGL%, industry: 28%, services: 72%	agriculture: 8%, industry: 45%, services: 47%	agriculture: 3.6 %, industry: 7%, services: 59.1%
Labor force (1994)	2,915,400	1,649,000	20,000,000	8,874,000
Literacy[3]	92.2%	91.1%	98%	86%
Compulsory school age	6-15 (9 yrs.)	6-16 (10 yrs.)	6-15 (9 yrs.)	6-15 (9 yrs.)

Sources: Bray, 1994; CIA, 1997; Shin, 1994; Yeoh, 1994.



Legend: aca.—academic tech.—technical

Note: 1. General education is shown in **boldface.**

2. The number in brackets represent the normal length of schooling in years.

Figure 3. A comparison of the structures of the formal primary- and secondary-education systems in the Four Little Dragons.

Hong Kong (HK)

Every child in Hong Kong begins six-year primary education (P1-P6) at the age of six. Beyond primary education, secondary schools offer a five-year course (S1-S5) in a broad range of academic subjects leading to the Hong Kong Certificate of Education Examination (HKCEE), which is equivalent to the GCSE in the U.K. Candidates for the HKCEE may enter a two -year sixth form course (S6-S7) leading to the Advanced Level Examination to prepare for admission to higher education institutes (Bray, 1994). The majority of secondary schools are grammar schools. Suggested curriculum time allocation for grammar schools is: languages, 35-40%; mathematics & science, 20-25%; humanities, 15-20%; cultural, practical & technical, 15-20%; and other learning activities, 5%(Wan & Lam, 1997).

The Curriculum Development Council (CDC) in the Education Department advises on curriculum at the preschool, primary, and secondary levels as well as special education. Taking the CDC's advice, most grammar schools offer design and technology (D&T) in junior secondary classes (S1-S3). According to the present "Syllabus for Design & Technology (Form I -Ⅲ)", which was published by the CDC in1983, the aim of junior-secondary D&T is to develop students' awareness of the challenge of technology and the ability to realize its promise. The aim of the present senior-secondary (S4-S5) D&T curriculum, revised in 1996, is to encourage students to explore and apply modern technological knowledge and skills, including computer-aided design (CAD), in producing artifacts or systems, and to respond to change in an age of rapid technological advancement (Wan & Lam, 1997). Emphasizing personal development and students' experiences through exploration and practical activities, the content areas of the junior-and senior-secondary D&T curricula are those listed in Table 2.

According to Wan and Lam (1997), at the junior secondary level, experiential learning areas such as the "exploration of material" and "manipulation of tools" are emphasized while at the senior secondary level, more time is spent on "materials processing" and "industrial processes." In addition, the following three D & T trends can be identified: (1) academically-oriented subjects, (2) updating of the curriculum, and (3) incorporation of information technology.

Table 2. Secondary- school D & T Curricula in Hong Kong

Junior secondary (S1-S3; i.e., Grades 7-9)	Senior secondary (S4 -S5; i.e., Grades 10 and 11)
1. Pre-requisite knowledge leading to design, exploration of materials (22 periods), design fundamentals (8 periods)	1. Design (35 periods)
2. Technological studies (22 periods)	2. Materials and materials processing (75 periods)
3. Actual design process	3. Engineering systems (35 periods)
4. Analytical & critical studies (8 periods)	4. Project work: small project (45 periods), exam. projects (50 periods)
5. Communication techniques	

Note: 1. The time allocation prescribed for junior secondary is calculated on a one - year basis while that prescribed for senior secondary is calculated on a two - year basis.

2. Every period is 40 minutes long on average.

Source: Wan & Lam, 1997.

Singapore (SN)

Every child in Singapore is required to receive six years of primary education and at least four years of secondary education. Primary education is structured in two stages : foundation and orientation. The foundation stages (Grades 1-4) emphasizes basic literacy and numercy. Pupils at the orientation stages (Grades 5 and 6) are streamed into the following three language streams: EM1 (English and mother tongue as first languages), EM2 (English as first and mother tongue as second language), or EM3 (English as first language and mother tongue for oral proficiency). At the end of Grade 6, pupils take a national placement examination called the Primary School Leaving Examination (PSLE). According to their performance on the PSLE, pupils are admitted to the special, express, normal (academic), or normal (technical) course. The special course is designed for the top 10% of the students who are academically excellent and competent in language learning. About 50% of secondary-school students go into the express course. Normal (academic) course students (about 20-25%) and normal (technical) course students (about 10-15%) are allowed an addition fifth year before they qualify to take the General Certificate of Education (GCE) O-level examination because they are less academically able than express course students. The former (academic) students enroll in academic courses while the latter

(technical) students, who are the lowest academically, enroll in technical courses. Students completing four years of studies in the normal course (academic or technical) take the qualifying GCE N-level examination. Those who succeed in this examination are allowed to proceed for the fifth year in the normal course. At the end of either five years of normal or four years of special or express course studies, the students take the common GCE O-level examination (Yeoh, 1994).

The Curriculum Planning and Development Division (CPDD) in the Ministry of Education (MOE) is responsible for ongoing review and systematic revision of the national curriculum as well as the subject-specific multimedia package for schools. According to the approved subjects syllabuses, the present secondary technology education curricular titles are those shown in Table 3.

Table 3. Secondary-school Technology Education Curricula Singapore

Level	Normal (technical)	Special, Express and Normal (academic)
Lower secondary (Grades 7 and 8)	Technical Studies (TS) (Compulsory examination subject; two periods/week)	Design & Technology (D&T) (Compulsory examination subject; two periods/week)
Upper secondary (Grades 9 and 10)	TS or D&T*(Elective examination subject)	D&T (Elective examination subject)

*Those who have design potential are allowed to take D&T.

As shown in Table 3, D&T prepare pupils for living and working in a technological world. It helps pupils to recognize the need for new or modified systems, and than gives pupils the capacity and confidence to design, make and evaluate these products and systems for themselves. In D&T, pupils are taught the design process and have the opportunity to work with multi-material, particularly, wood, metal and plastics, to enable them to acquire knowledge of a range of materials and to develop manipulative technical skills to realize solutions to design programs. Designed for normal (technical) course students, TS has been specially tailored to equip pupils with a level of functional proficiency to pursue post-secondary industrial and engineering-biased courses at Institute of Technical Education. Compared to D&T, TS has an emphasis on practical work, the development of psychomotor skills and the acquisition of work attitudes (Tang, 1995). Obviously, streamed curricula may be the main characteristic of technology education in Singapore.

South Korea (KS)

In South Korea, both elementary and secondary education last for six years.

Secondary education is composed of three years in middle school and three years in high school. High schools are mainly divided into general (academic) high schools and vocational high schools. Almost all of the specific details of school curricula are determined by the Ministry of Education (MOE). Based on the present secondary-school curricula revised in 1992, the secondary-school technology education curricula is shown in Table 4.

Table 4.
Secondary-school Technology Education Curricula in South Korea.

Level	Subject Title	Time allocation
Middle (Grades 7-9)	Technology & Industry	Grade 7: one hour /week Grades 8 and 9: two hours/ week
High (Grades 10-12)	1. Technology (8), 2. Home Economics (8), 3. Agriculture (6), 4. Industry (6), 5. Commerce (6), 6. Fishery (6), 7. Housekeeping (6), 8. Information Industry (6), 9. Career & Vocation (6)	Each high school selects two (or one) subjects among the nine subjects shown to the left.

Source: Kim, 1997.

Both the middle-and high-school curricula are undergoing revision. Middle schools will use the new curriculum in 2001while high schools will do so in 2002. In the new curricula: (1) students in middle schools will study the integrated subjects of technology and home economics (two hours/week for 7th graders and three hours/week for 8th and 9th graders); (2) 10th graders in high schools will study the integrated subjects of technology and home economics (three hours/week) as in middle school while 11th and 12th graders will choose from among the following six subjects: information society and computers (4 units), agricultural science (6 units), industrial technology (6 units), business administration (6 units), ocean science (6 units), and home economics (6 units) (Kim, 1997).

Taiwan (TW)

The present school system in Taiwan is based upon the 6-3-3 system: six years in elementary school, three years in junior high school (JHS), three years in senior high school (SHS) or senior vocational school (SVS). Curriculum standards for each school level are determined and promulgated by the Ministry of Education (MOE), and each

school's curriculum is planned and authorized textbooks are edited on the basis of the national curriculum standard. Secondary - school technology education is prescribed in curriculum standard; however, the newly-revised junior-high-school and senior-high-school curriculum standards went or will go into effect in the 1997 and 1999 school years, respectively. Based on the present and new curriculum standards, the main subjects of technology education can be summarized as shown in Table 5. In addition, some elective courses related to technology education are recommended in both the junior-high and senior-high curriculum standards. Compared to IA, LT is more systematic and design-oriented with an emphasis on gender equity.

Table 5.

Secondary-school Technology Education Curricula in Taiwan. .

Level	Present Title and Synopsis	New Title and Synopsis
Junior high (Grades 7-9)	Industrial Arts -All students are required to select "Industrial Arts" (IA) or "Home Economics" (HE). -IA consists of two hours/week or about 216 hours in three years. -IA consists of 13 domains.	Living Technology -All students are required to take "Home Economics & Living Technology" (HE&LT), two hours/week. -LT in HE&LT consists of one hour/week or about 108 hours in three years. -LT includes 4 domains.
Senior high (Grades 10-12)	Industrial Arts -All students in grades 10 and 11 are required to take IA or HE, but schools commonly assign boys to IA programs. -Two hours/week or about 144 hours in two years. -IA consists of five domains.	Living Technology -All students in grades 10 and 11 are required to take HE&LT, two hours/week. -LT in HE&LT consists of one hour/week or about 72 hours in two years. -LT includes four domains, which are the same as those in junior-high-school LT.

Source: Lee, 1997.

Based on the above description and a further cross-country / entity comparison, at least the following four conclusions can be drawn:

1. Technology education is prescribed in the national curriculum.

All four countries/entities have uniform school curricula. All of them require

lower-secondary-school students to receive technology education and offer upper-secondary-school students elective technology curricula. Additionally, both South Korea and Taiwan require students to receive technology education in the earlier grades at the upper-secondary level.

2. Information technology is being increasingly incorporated into technology education.

   The computer is the most significant technological invention of the 20th century. It is found that serious effort has been made to incorporate the components of information technology into the technology education curricula in the four countries/entities.

3. The major trend in these technology education programs is a focus on the design process.

   Higher-order thinking or the intellectual process is being increasingly emphasized in the technology education curricula in the four countries/entities. That is, the design/problem-solving/procedural process is being increasingly incorporated into the contents of technology education.

4. Some common problems faced by the Four Little Dragons in the implementation of technology education.

   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 four countries/entities in the implementation of technology education programs.

Implications

In addition to the conclusions presented above, at least the following two implications can found:

1. There should be more dialogue among technology educators from the Four Little Dragons.

   This comparison found that there is little communication among technology educator representing the Four Little Dragons. There should be more dialogue in the future.

2. Taiwan has a good chance to foster its technology education.

   Along with the other three Little Dragons, Taiwan, where technology education programs are required for Grades 7-11, has good potential to foster technology education provided that there is ongoing and systematic curriculum development as well as effective professional supervision.

References

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

Rinehart
and Winston.

Bray, M. (1994). Hong Kong: System of education. In T. Husen & T. N. Postlethwaite (Eds.). The international encyclopedia of education (2nd ed., pp. 2636-2643). New York: Elsevier Science.

Central Intelligent Agency (CIA). (1997). The 1996 world factbook. Available http://www.odci.gov/cia/publications/nsolo/wfb-all.htm.

Central News Agency and The China Post staff. (1998). ROC leads in policy making. The China Post, February 2, 20.

Education in Korea 1995-1996. Ministry of Education, Republic of Korea.

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.

Shin, S. (1994). Korea, Republic of: System of education. In T. Husen & T. N. Postlethwaite (Eds.). The international encyclopedia of education (2nd ed., pp. 3161-3170). New York: Elsevier Science.

Yeoh, O. C. (1994). Singapore: System of education. In T. Husen & T. N. Postlethwaite (Eds.). The international encyclopedia of education (2nd ed., pp. 5476-5485). New York: Elsevier Science.

Author Note

Dr. Lung-Sheng Lee (李隆盛in Chinese) 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 Industrial Technology Education Association (ITEA, formerly called the Chinese Industrial Arts Education Association--CIAEA), Taiwan, R.O.C. and an adviser to the Science and Technology Advisory Office, Ministry of Education (MOE), R.O.C.

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]In the Chinese language, Chinese (華人, pronounced *hwaren* in Chinese) does not simply represent the people of mainland China. That is, Chinese here refers to those people, such as most Taiwanese and Singaporeans, whose ancestors were from mainland China along with the people who live in mainland China.

[2]During the conference, the Constitution of ICTE was signed by representatives from the following seven technology education associations or societies:- the Japanese

Society of Technology Education (JSTE), Japan; Technology Education New Zealand, New Zealand; the Korean Institute of Industrial Educators (KIIE), the Republic of Korea; the Chinese Industrial Arts Education Association (CIAEA), Taiwan, R.O.C.; the Technology Education Federation of Australia (TEFA), Australia; the International Technology Education Association (ITEA), U.S.A.; the 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 KIIE and held in Korea in 1999.

[3]Percentage of the population 15 years of age and above that has attended school (1995 est.).

CE015852

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

REPRODUCTION RELEASE

(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title: **Four Little Dragons' Technology Education**

Author(s): **Lung-Sheng Lee**

Corporate Source: **National Taiwan Normal University**

Publication Date: **March 8-10, 1998**

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 media, and sold through the ERIC Document Reproduction Service (EDRS). 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 three options and sign at the bottom of the page.

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)

1

Level 1

☑

Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g., electronic) *and* paper copy.

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

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2A

Level 2A

☐

Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only

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

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2B

Level 2B

☐

Check here for Level 2B release, permitting reproduction and dissemination in microfiche only

Documents will be processed as indicated provided reproduction quality permits.
If permission to reproduce is granted, but no 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 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, →

Signature:

Printed Name/Position/Title: **Lung-Sheng Lee, Professor**

Organization/Address: **Department of Industrial Technology Education**
National Taiwan Normal University
162 Hoping E Road, Sec 1
Taipei 106, Taiwan

Telephone: **886-2-2321-3664**
FAX: **886-2-2392-1015**
E-Mail Address: **t83006@cc.ntnu.edu.tw**

Date: **March 5, 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 this 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:

Acquisitions Coordinator
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: