In Taiwan, technology education used to be called "industrial arts," but was changed to "living technology" in 1997. The goals of craftwork in elementary school are to provide an understanding in the areas of presentation, appreciation, and practical application of the arts. Curriculum content is divided into the three areas. Instruction is principally through hands-on experience, audiovisual materials, and field trips. The goal in junior high school is to provide knowledge and skills in the areas of tools, materials, and production process. The curriculum is divided into 13 areas based on materials and process, each area covering relevant knowledge and skills. Instructional methods include hands-on activity, learning-by-doing, and projects. The aim of industrial arts in senior high school is to provide knowledge of industrial technology, develop industrial skills, stimulate interest in design and creation, and develop good working habits and attitudes. The curriculum uses the integrative concept of industrial cluster. Instruction includes laboratory practice, audiovisual media, and field trips. Craftwork and industrial technology education departments of teachers' colleges and normal universities supply teachers. Problems and obstacles are heavy teacher workloads and poor teaching environment. Future aims are infusing technology education into elementary schools and emphasizing interdisciplinary and experience-based curriculum design. (YLB)
An Introduction to Technology Education in the Republic of China on Taiwan

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The purpose of this booklet is to introduce the background, current situation, and future outlook of technology education in the Republic of China on Taiwan.

I. Background

In Taiwan, technology education is called "industrial arts", a name that will be changed to "living technology" in the school year of 1997.

At the elementary-school level, craftwork is similar to industrial arts, with an emphasis on work education before 1975. Since then, craftwork as a subject has concentrated on fine arts and has gradually become different from industrial arts.

At the junior-high-school level, "handicrafts," "work" and "production work" were the predecessors of industrial arts. Initially, industrial arts included woodworking, metalworking and vine-and-bamboo-working, and gradually expanded to include electricity, graphic communication, construction, manufacturing, information, energy and power, etc.

In senior high schools, it was only after 1940 that "work" which was later to become known as "industrial arts", was included in the curriculum. Initially, it consisted of drafting, woodworking, metalworking and electricity, and gradually expanded to include project design and drafting.
II. Current Status

(I) Elementary School

(1) Goals

The goals of craftwork are to provide an understanding in the areas of presentation, appreciation and practical application of the arts, and also to provide an appreciation of the technology designed to upgrade the quality of life.

(2) Curriculum Structure

The contents of the curriculum are based on the fixed objective of each year and are divided into three areas--presentation, appreciation of the arts and practical application. Practical application covers the knowledge and skills of craftwork and tries to relate it to the students' own lives.

(3) Implementation and Evaluation

1. Teaching Hour

The course is 2 teaching hours per week for 1st and 2nd grades, and 3 for 3rd -6th grades.

2. Methods of Instruction

Principally through hands-on experience, audio-visual materials, and field-trips.

3. Instructional Strategies

The aim is to provide a comprehensive and systematic program of activities ranging from basic introductions to in-depth analysis. The program
3. 教學重點:

用統整性的概念與系統化的訊息，安排由淺至深的系列活動。過程中明確的告訴學生製作的目的和條件，讓學生理解所需的技術與製作的程序。老師也與學生共同討論製作的計畫並預測完成的作品，使學生在有系統的引導之下，學習各種技術與知能。

4. 教學評量:

評量標準可分為「表現能力」、「審美能力」、「生活實踐」三部份。評量兼顧過程與結果以及團隊表現。並配合老師平時對學生各種學習表現與學習態度的觀察，作為評量的依據。

二、國中

(一) 課程目標

現行國中工藝課程於1984年正式實施，主要目標在於教導學生工具、材料和加工程序等知識、技能，使學生瞭解工業社會生活及正確之工作觀念，並提供職業試探的機會。

(二) 課程架構

依材料和程序分成十三個領域，各領域都有知識和操作兩部份，其課程架構如下:

should enable students to acquire a clear understanding of the entire technical and making process, from the planning stage through to the finished product.

4. Evaluation

The emphasis is on process, results, and teamwork. Teachers should also take into account the students' attitude and performance.

Fig. 1 Craftwork instruction in an elementary school

(II) Junior High School

(1) Goals

The current curriculum was developed in 1984, with the objective of providing knowledge and skills in the areas of tools, materials, and production process. Hopefully, an insight into life in an industrial environment and society can be provided along with career exploration opportunities.

(2) Curriculum Structure

The curriculum is divided into 13 areas based on materials and process. Each area covers knowledge and skills relevant to the particular material or process.
1. First School Year

a. First Semester
   - Introduction to industrial arts
   - Drafting and Planning
   - Woodworking (I)

b. Second Semester
   - Ceramics
   - Plastics
   - Metalworking (I)

2. Second School Year

a. First Semester
   - Woodworking (II)
   - Metalworking (II)
   - Graphic communication

b. Second Semester
   - Electricity
   - Construction and Life

3. Third School Year

a. First Semester
   - Manufacturing industry
   - Information industry

b. Second Semester
   - Audio-visual communication
   - Energy and Power

(3) Implementation and Evaluation

1. Teaching Hour

   The teaching hours are 2 consecutive periods per week.

2. Methods of Instruction

   Methods include hands-on activity, learning-by-doing, and projects which should cover a variety of aspects of fabrication, experimentation, maintenance
3. Instructional Strategies

The emphasis is on the use of instructional media and strategies to impart knowledge and skills, encouragement of individual planning to improve creativity, as well as safety and good working habits.

4. Evaluation

Both process and results are evaluated by means of written tests and practical assignments.

(III) Senior High School

(1) Goals

The present industrial arts curriculum in senior high schools was formally implemented in 1984. The aim of the subject are mainly to provide knowledge of industrial technology and to develop industrial skills, to stimulate interest in design and creation, and to develop good working habits and attitudes.

(2) Curriculum Structure

The curriculum structure of industrial arts employs the integrative concept of industrial cluster in inquiring modern industrial civilization.
1. First School Year
   a. Project Planning and Drafting
   b. Industrial materials
   c. Energy industries

2. Second School Year
   a. Information industry
   b. Automation

The contents can be adjusted according to each individual school's facilities, local characteristics, and students' abilities and needs.

(3) Implementation and Evaluation

1. Teaching Hour

   Industrial arts class is taught for two class hours every week in the first and second school years. These classes should be arranged consecutively.

2. Methods of Instruction

   Knowledge and lab practice should both be emphasized with the assistance of activities such as use of audio-visual media and field-trips.

3. Instructional Strategies

   Instruction should focus on experiments, manipulation and provision of knowledge, and help students to integrate knowledge from various domains such as mathematics, physics, chemistry, etc. Projects should suit to students' abilities and stimulate their interests. Instructors should encourage students to try their best and to design things independently. Additionally, instructors should arrange group projects on a cooperative basis. Instructor should also encourage students to bring unworkable household utensils to schools and repair them together. Furthermore, the development of good habits such as site safety, maintaining equipment in good condition and site cleanliness should be
III. Teacher Education

Craftwork teachers in elementary schools are almost all graduates of the craftwork education departments/programs of teachers' colleges. Technology education teachers in junior and senior high schools are mainly from the Department of Industrial Technology Education of National Taiwan Normal University or National Kaohsiung Normal University. After the Teacher Preparation Law was passed, the backgrounds of teachers have become more diverse. However, since living technology demand the possession of specialized knowledge and skills, the craftwork education department and the industrial technology education department of the teacher's colleges and normal universities continue to be the major institutions for supplying qualified teachers.

Currently, the Department of Industrial Technology Education of both the normal universities offer masters' programs, which provide the opportunities for inservice teachers' advanced studies and also work on information exchange, research and development for promoting the quality of technology education.

IV. Instructional Resources

Textbooks are edited by private publishers and reviewed by the National Institute for Compilation and Translation, and selected by school teachers. The
materials required for teaching activities are mostly decided by teachers and are purchased from manufacturers, and the students pay these charges themselves. Additionally, Taiwan Provincial Education Department publishes the “Secondary-school Industrial Arts Monthly” to provide teachers with the latest information in the field of technology education, and conferences organized by the “Chinese Industrial Arts Education Association” provides opportunities for information exchange.

V. Problems and Obstacles

(1) Misunderstandings arising from the naming of subjects.

Many people consider the term “industrial arts” to refer to traditional “handicrafts”, and therefore misunderstand the essence of industrial arts.

(2) Heavy workload of teachers

Industrial arts education is not included on entrance examinations for further study, and therefore is usually considered a “lesser” subject and not highly regarded by school administrators, parents and students alike. Furthermore, class sizes are large and teaching resources inadequate. In fact, teaching hours are longer than for other subjects. This puts a heavy burden on industrial arts teachers, and under these conditions morale among industrial arts teachers is generally low.

(3) Poor teaching environment

The teaching environment for industrial arts in many schools is of an inferior standard. For instance, space is limited, the number of labs is inadequate, equipment is out-of-date, and so on.
In the future, "living technology" will be aimed at enhancing the technological literacy among the general population. The goals of technology education at each stage are: technological awareness in elementary schools, exploration of technology in junior high schools, and technological orientation and preparation in senior high schools. The following are the future aims of technology education:

1. Infusing technology education into elementary-school level craftwork.

2. Emphasizing interdisciplinary and experience-based curriculum design.

3. Developing the school-based program in accordance with technological literacy standards.

4. Increasing exchanges, both at home and overseas, regarding the theoretical and practical aspects of technological education.
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