DOCUMENT RESUME

ED 267 278 CE 043 953

AUTHOR Katz, Martin R.
TITLE The Buddha and the Computer: Career Guidance in Taiwan.
INSTITUTION Educational Testing Service, Princeton, N.J.
REPORT NO ETS-RR-85-35
PUB DATE Aug 85
NOTE 39p.
AVAILABLE FROM Educational Testing Service, Research Publications R-116, Princeton, NJ 08541.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Career Choice; *Career Guidance; Counselor Training; Culture Conflict; *Culture Lag; Decision Making Skills; Educational Needs; Foreign Countries; *Futures (of Society); Program Implementation; *Program Improvement; *School Guidance; Secondary Education; Student Evaluation; Technological Advancement; Testing
IDENTIFIERS *Taiwan

ABSTRACT

Career decision making in Taiwan was examined in the context of a society undergoing dynamic change as modern entrepreneurial values are accommodated in a cherished traditional culture. Especially during the past 20 years, the economy of Taiwan has changed from agriculture to technology. At the same time, the educational needs of students have changed as more educated workers are needed to develop the technology for the new society. The focus of guidance counselors in Taiwan, however, has traditionally been on helping students to prepare for the examinations that take place after ninth grade and allow students who pass to go to college. Until recently, little attention has been paid to students who do not pass the examinations and thus do not qualify for college education. Few efforts have been made to acquaint these students with jobs for which they could prepare outside agriculture. As a result of this study, recommendations were made on the following topics: rationale for guidance, model of career decision making, individual assessment, development of occupational information, linkages between individual characteristics and occupational attributes, strategy and algorithm for career decision making, testing, and counselor preparation. (Author/KC)

RR-85-35

RESEARCH REPORT

THE BUDDHA AND THE COMPUTER: CAREER GUIDANCE IN TAIWAN

Martin R. Katz

Educational Testing Service
Princeton, New Jersey
August 1985

Abstract

Career decision making in Taiwan is examined in the context of a society undergoing dynamic change as modern entrepreneurial values are accommodated in a cherished traditional culture. Recommendations are made on the following topics: rationale for guidance, model of career decision making, individual assessment, development of occupational information, linkages between individual characteristics and occupational attributes, strategy and algorithm for career decision making, testing, and counselor preparation.

The Buddha and the Computer: Career Guidance in Taiwan

On a ridge overlooking Changhua City sits a huge Buddha, about five or six stories high, the biggest in Taiwan. From it one can scan the tall smoke stacks of a modern chemical plant, rooftop fish farms on apartment buildings, the congested traffic of a bustling city, a college campus, bright green rice paddies nestled in a space between buildings, a busy superhighway and railroad, large schools, open-air markets, a cultural center, and an immense gymnasium. At dawn, people climb steep steps to the Buddha and nearby temple, or hike, jog, bicycle, or motor up the sloping road, perhaps do some exercises -- then descend and go about the day's work or study. That work or study is likely to deal with high technology, perhaps in manufacture of plastics or computerized storage, retrieval, and analysis of information. The Buddha and the computer symbolize the mingling of the traditional and the modern in Taiwan.

Taiwan offers an unusual opportunity to observe the transition from school to work in a society that is itself undergoing rapid transition. This society has demonstrated spectacular economic growth and accelerated technological development over the last three decades. While agricultural production has increased bountifully during that time (under a land ownership reform program), the relative contribution of agriculture as a percentage of the Gross National Product dropped to a third of what it had been 20 years ago. In the past decade, agriculture has dropped to about 1.3 million workers, while industrial employment has increased to about 2.9 million, and services to over 2.8 million. The rapid sustained growth of industry has been seen particularly in manufacturing that involves high technology: textiles, plastics, machinery, electrical appliances and electronics, ships, and automobiles and motorcycles. High productivity at low cost has resulted in a favorable balance of trade: Exports now exceed $25 billion a year (50% of the GNP), and imports are about $20 billion

(oil being a major import). The GNP has grown at an average rate of 8 percent to 10 percent annually over the last 30 years. Unquestionably, Taiwan has been one of the fastest developing countries in the world.

Economic development has taken place under a government that fosters entrepreneurial capitalism in conjunction with strong central planning. To keep pace with and sometimes stimulate the rapid expansion of industry, the government has invested heavily in major construction projects to improve electrical power, transportation, and other components of infrastructure. These have included nuclear power plants, highways, railroads, airports, harbors, shipyards, steel mills, and dams. During all this expansion, the inflation rate has been kept low, and unemployment (despite a recent increase) has remained below 3 percent.

This booming pace of development and modernization has occurred in the context of an ancient and traditional culture, no less cherished because its people have felt displaced from their mainland source. Indeed, the people define themselves most emphatically as Chinese (not Taiwanese). As the People's Republic of China gained diplomatic recognition from other countries (and Taiwan lost it), the people of Taiwan have taken particular pride in their economic success. They have driven energetically toward making their modern entrepreneurial and capitalistic system work, while protecting zealously as much as possible of the form and substance of traditional Chinese values, customs, and relationships.

Although Chinese culture is too complex to summarize in a few sentences, we can illustrate the contrast between traditional and modern forces (at the risk of oversimplification) by selecting two major strands from the intricate network of beliefs and attitudes. One is the strong tradition of family relationships defined by Confucius (Hsu, 1967), emphasizing close kinship ties, veneration of elders, and filial piety. Even under the strain of industrialization and the attendant diminution of

economic control by the extended kinship group over its members, major elements of this tradition have been preserved: Youthful conjugal family units still pay their respects to parents and grandparents. Yet modernization has brought also an emphasis on the worth of the individual, substituting meritocratic control -- as opposed to kinship control -- of such rewards as wealth and status (Goode, 1963). Another basic traditional theme is the dominance of fate, regulated by particular combinations of heavenly and earthly forces (Yang, 1961). This traditional theme seems to conflict with aggressive entrepreneurial values and emphasis on individual achievement and responsibility (Lin, 1982).

Indeed, in observing the transition from school to work in this society that is itself in transition, one would expect to find many sources of conflict in the mingled commitments to modernization and tradition, to change and preservation, to Western ways and Chinese culture. Yet the economic transition seems to be taking place in a relatively harmonious and accommodative mode. Elements of both cultures seem to coexist quite peacefully in an atmosphere of mutual tolerance, respect, and pragmatism.

Perhaps the harmonious mingling of traditional cultural values with modern industrial values, of obedience to elders with personal ambition, of belief in fate with belief in individual responsibility, can be recognized as a contemporary manifestation of the traditional goal of perfect harmony between Yin (representing static, passive, accepting, yielding elements) and Yang (representing dynamic, active, assertive, positive forces).

Perhaps also the fact of being an island nation, beleaguered in a world that does not formally accept its nationhood or its government's claims to legitimacy (on its own island or on the mainland from which it was ousted), has fostered a siege mentality, a sense of unity by

necessity, an urgent need for people to draw together in defense of their own identity. It is as if there were a nearly universal recognition that conflicts must be resolved with as little friction as possible if the country is to survive and prosper -- and perhaps some day (in Chinese time) regain its identity with the mainland on favorable terms.

Both education and work are crucial components in the over-all strategy for survival, prosperity, and integrity. Like most other elements in Taiwan, they are in the process of change. Perhaps something constant in the midst of all this mobility should be examined first in setting the context for guidance in Taiwan: So let us look briefly at the geography of Taiwan, and the ways in which the people and their economy have interacted with it.

Geography and Climate

Taiwan is an island off the southeast coast of mainland China, on the western edge of the Pacific Ocean. It is about 394 kilometers long and about 142 kilometers wide. Taiwan means "terraced bays," and it has a coastline of about 1566 kilometers, including some of the biggest ports in the world (e.g., Kaohsiung, Taichung), as befits a country heavily committed to foreign trade.

A mountain range with jagged peaks reaching up to 4,000 meters above sea level runs north to south and covers 70 percent of the area. The mountains drop sharply to the ocean on the east, leaving room for little more than a narrow strip of highway and beach. The fall to the west is less abrupt, and the western plain holds most of the agriculture, the big cities (e.g., Taipei with 2.5 million people, Kaohsiung with 1.3 million), and the major harbors. The dominance of the mountains is particularly significant when one considers that the population of the island is about 19 million -- second only to Bangladesh as the most densely populated region in the world! -- even though most of the area is so mountainous as

to be virtually uninhabited. This means that the major cities tend to be congested, and every arable piece of land is used for agriculture -- including (for example) terraces for pear trees on steep mountain slopes, tidelands for duck farms, river flood plains for watermelons, and even rooftops for fish farms. Due to this intensive use of land, the country not only is self sufficient in food production but also exports agricultural products, even though only about 25 percent of the population lives on farms. Also contributing to agricultural productivity was a land reform program: as a result, 90 percent of the land is farmed by owners.

The climate is conducive to agriculture, permitting multiple harvests of some crops. The Tropic of Cancer divides Taiwan into tropical and subtropical zones. The average temperature is over 20 degrees C, and annual rainfall is over 2500 millimeters but not evenly spread across the island. The North is rainy and windy in winter and spring, while the South tends to be dry and warm. The whole island is hot and humid in summer, with heavy thundershowers and occasional typhoons. Because of the rugged terrain, rivers tend to be short and swift, often fed by waterfalls. Some of these rivers have been dammed for irrigation and hydroelectric power. Thus we see, in the harbors and dams, the terraces and fish farms, and also in the use of forests for timber (accompanied by a program of reforestation), mining (under difficult circumstances) for coal, and quarrying of mountains for marble, a planned and systematic utilization of geographic and climatic resources to the maximum degree. In an economic system that combines entrepreneurial capitalism with central planning, natural resources are intensively exploited in conjunction with an extensive program for the preservation of nature.

Population and Demographics

The theme of planning is also strongly evident in recent population

trends. As mentioned above, 19 million people reside on an island of which about 70 percent is so mountainous as to be virtually uninhabitable. In recognition of this density resulting from a doubling of the population since 1946, a program of family planning was inaugurated. Consequently, the birth rate dropped from over 38 percent in 1947 to less than 21 percent in 1983. Since the death rate also dropped sharply (from 18 percent in 1947 to less than 5 percent in 1983), the natural rate of increase is about 16 percent; it is expected to be below 13 percent by 1989. The average family size is now 4.5.

Land ownership reform and other benefits to farmers have also been planned, at least in part, to make farm life attractive and prevent further migration from farms to the already congested cities.

Most of the population is of working age. About 31 percent of the people are less than 15 years old, almost 65 percent are between 15 and 64, and over 4 percent are 65 or over. It is also interesting to note that the ratio of males to females is 108 to 100. The active labor force is about 39 percent of the total population. In short, the population is rather young, with a ratio of 100 "working-age" persons to 55 who are below or above the typical "working age." The distribution of people by age indicates there will be a steady influx of young workers to be absorbed by the economy. At the same time, the dynamic nature of the economy, with increasing emphasis on high technology, suggests that many mature workers may be changing their occupations. Thus, education, vocational training, and career guidance are seen as important elements in manpower planning for sustained high employment, for improvements in productivity, for continuing technological development in adding an "information economy" to the "industrial economy," and (of increasing importance to avoid emigration of able people) for enhancing individual

success and satisfaction in the world of work. Education is accorded great importance by the Chinese, and the educational system requires some description as a major component of the context and the content for career guidance.

The Educational System

Universal education has been provided through junior high school (grade 9) since 1968. Virtually all persons in the appropriate age groups are now enrolled in the grades from kindergarten through grade 9. From that point on, advancement through the educational system depends on passing tests required for entry to each successive level: senior high school, college, graduate school. For a graphic outline of the educational system, see Figure 1, The Current School System (Ministry of Education, 1984). Tests also play an important part in determining employment in many occupations, certification, evaluation, and promotion. For example, appointment to civil service jobs depends on passing tests administered under the jurisdiction of the Examination Yuan, a branch of government deemed so important as to be coordinate with the Executive Yuan, the Legislative Yuan, the Judicial Yuan, and the Control Yuan.

The first transition from school to work comes for many young people at the end of grade 9. Regional achievement tests determine admission to the senior level of secondary education: Students within each region of the country are chosen in rank order of test scores until the number of places in their region has been filled. Counselors express concern about the severe pressure on students to pass these tests; they believe it is responsible for many psychological disturbances. Indeed, some parents take their children abroad to avoid this pressure in the junior high school years. In each of the last 10 years, 50-60 percent of the students completing 9th grade passed the tests to gain admission to grade 10. Of the other 40 percent, some seek to undertake remedial education and try

the tests again in a later year. (Those who pass the retests increase the annual number of entrants to grade 10 by about 16 percent.) Others look for employment or vocational training designed to lead directly to a particular occupation. These others are in immediate and pressing need of vocational guidance. Until the middle of July, their guidance and placement remains the responsibility of the junior high school counselors. After mid-July, the counselors send lists of those still unplaced to regional Employment Service centers for further testing, counseling, vocational training, and placement. (The centers, under the jurisdiction of the Employment and Vocational Training Administration, Ministry of the Interior, are a substantial portion of the career guidance apparatus, and will be described later.)

Of students who go on to grade 10, some enter senior high schools (enrolling over 190 thousand students in 1984), and most others enter senior vocational schools (in which 405 thousand students were enrolled in 1984). Other options at this stage include some 5-year junior colleges and the military schools (the latter to prepare for entry into the military as low ranking officers or to postsecondary military academies to prepare for higher ranks). The senior high schools are mainly for those who plan to continue in postsecondary education, and the vocational schools for those who plan to enter industry, commerce, agriculture, and other employment after graduation (although some may eventually succeed in entering college by passing departmental tests for a chosen field of study).

Because of the high value placed on obtaining as much education as possible, many students and their parents regard admission to a senior high school as most desirable. There, the 10th-grade student decides on a "physical science" or "social science" emphasis, leading to a concentration in grades 11 and 12 in one of four groups: (A) physical science and engineering; (B) liberal arts and social science; (C)

pre-medical, biology, agriculture; (D) pre-law and business. (It is expected that groups B and D will be merged next year.) Until last year this departmentalization was rigid; now it is possible for students to change by passing tests for another department. At the end of grade 10, those who have chosen group A must pass a teacher-made test in mathematics to stay in the physical science "major." To assist students in choice of curriculum, counselors may administer Chinese translations and adaptations of various American-published standardized tests: the Differential Aptitude Tests, the Brainard Occupational Preference Inventory, and the California Test of Mental Maturity. Students take the test scores to their parents, whose wishes are generally regarded as dominant in determining students' decisions. Counselors generally do not believe the tests have much influence on the choices.

At the completion of senior high school, in July, students take the national College Entrance Examinations, achievement tests prepared by committees of examiners from college faculties. Students take from 7 to 10 tests, depending on how much flexibility they want in choosing college departments. Some of the tests (e.g., Chinese History and Culture, English, Three Principles of the People) are common for all departments. Others (e.g., physical science mathematics or social science mathematics) are differentiated by departments. After receiving their score reports, students rank order their preferences for various college-department combinations. The college departments make admissions decisions, and a computer matching system assigns students to the highest ranked preference of a college-department for which they have been accepted. Because the relative prestige of the colleges often looms large to students and their parents, many students tend to give a high rank to a less preferred department in a high-prestige college and a lower rank to a department deemed more appropriate in a college with lower prestige. (If they get

into the high-prestige college, they may later attempt to change departments.) Recently, up to 46 percent of the senior high school graduates of a given year have been able to pass the tests for entry to a postsecondary institution. (The number of admissions has been nearly doubled, however, by high school graduates of previous years who pass the tests after remedial study -- there is no limit on the number of times they can try.) Of those who fail, males are likely to enter compulsory military service, then seek remedial education and take the tests again or else enter directly into employment or specific vocational training; females are exempt from military service.

There are 105 postsecondary institutions; they include 16 universities, 12 colleges, and 77 junior colleges, and enroll a total of 400 thousand students. The junior colleges tend to focus on the applied sciences and the training of technicians, although some are "normal schools" for the training of elementary school teachers. There are 5-year junior colleges for junior high school graduates, 3-year junior colleges for senior high school graduates, and 2-year junior colleges for senior vocational school graduates; their students may transfer to a college or university, with the loss of one year (e.g., second-year rather than third-year standing), by passing appropriate departmental tests. Those who do not transfer enter military service (if appropriate) or the work force. After completing the second year of a 4-year college, students may also transfer from one department to another by passing a departmental examination. If they fail it, they must remain in their original department.

College and university departments offer mainly 4-year undergraduate programs, except for a 5-year program for prospective teachers. Medical departments offer 7-year combined undergraduate and graduate programs (thereby requiring early commitment), but beginning in 1982 4-year medical

schools were also established to enroll graduates of 4-year undergraduate programs that included relevant science courses. Graduates of 4-year colleges can also, after passing appropriate tests, be admitted to M.A. and Ph.D. programs, generally taking two years and four years, respectively. About 2500 master's degrees and fewer than 100 Ph.D.'s were awarded last year. Thus, most college graduates enter work (or military service and then work) after graduation, although many go abroad for graduate and professional study.

After completing college or graduate or professional school, most students still have to find their own jobs. For some, however, there is a formal system of placement. For example, graduates of many departments in schools of education can rank-order their preferences for the regions in which they wish to teach. The higher their academic standing, the better their chances of being assigned by the Ministry of Education to a high-ranked preference. Civil service examinations must be passed for government positions, and many other jobs also depend on ability to pass employment tests. Tests are also used for rating of workers' levels of skills, for promotions, and for certification.

In short, it is clear from this description of pathways through the educational system that advancement in education and in occupations depends on tests of various kinds at specific points of "discontinuity." For many years the pervasive reverence for education -- the desire to get as much education as possible -- led people to regard these discontinuities as gates that swung open for those who passed tests and remained closed to those who failed them. Thus, energies were devoted singlemindedly toward passing tests and progressing in education. People who failed the first attempt would take remedial instruction, often in expensive private schools, in order to prepare for another round of testing, or would enroll in the public "supplementary" school system. The

number of such supplementary schools has risen to enroll 64 thousand students in elementary and general secondary education, 171 thousand in vocational education, and 28 thousand in junior colleges.

Guidance in Schools and Colleges

In the single-minded striving for more education, however, it is also clear that too little attention was being paid to the people for whom the gates to further education remained closed. Since 1978-79, when guidance was extended down to the elementary schools, counselors have been present at every level of education in Taiwan. For the most part, however, the counselors have appeared to concentrate on helping students prepare for and pass tests and so progress through the educational system. They have also seemed to be interested in attempts at psychotherapy (Lin, 1982). Until recently no one had paid much official attention to career decision making, not only for those who dropped off the educational stairway at any gate, but even for those students who had to make educational choices as they advanced from one level of schooling to another.

When I arrived in February 1985 as a visiting professor specializing in guidance for career decision making (CDM), I was often asked why CDM should be of any concern to counselors or their students: "Chinese students just want help in passing the tests to go on to the next level of education," I was told. "They are not interested in career planning." Partly in response to this contention, I constructed a flow chart of the Taiwan educational system, highlighting the main choice points; this chart emphasized the fact that there were many stages at which career decisions were being made, explicitly or implicitly. I suggested that the process of CDM could be improved by making it explicit. I also pointed out that in an economy that has moved so swiftly and has now developed much greater complexity and maturity, perception of the need for career guidance is increasing. The transition from a largely agricultural to an industrial

and information economy has brought about growth in the number of occupations with low visibility. The work of farmers has always been highly visible to young people. But very few students have a chance to observe and understand the activities of such occupations as electronic engineer, computer programmer, production manager, and so on. Yet people have become much more conscious of the variety of career opportunities open to them. They have also come to recognize the likelihood of changing occupations several times in the course of a career in response to the volatility of an economy that depends so heavily on exports. So concern for career guidance now appears to be growing rapidly among students, workers, counselors, and the appropriate government ministries. During my stay, lectures on computer-based career guidance and demonstrations of existing computerized guidance systems proved to be particularly appealing. It now seems likely that school and college guidance programs will devote much greater attention to career decision making, and that efforts will be made to adapt existing computer-assisted guidance systems to Chinese needs, or to develop an indigenous system. Recommendations for this kind of development were prominently included in my report to the National Science Council.

The need for career guidance, however, is not confined to students with access to school and college counselors. As indicated above, a majority of the students completing junior high school fail to be admitted to college. Their employment needs and those of adults who must change jobs have been addressed by the establishment, in 1981, of the Employment and Vocational Training Administration (EVTA) under the Ministry of the Interior.

Role of the EVTA in Career Guidance

In its short existence, much of the work of the EVTA has focused on vocational training. Under its supervision, vocational training institutes

have been established to provide pre-employment training for people aged 15 and over, particularly graduates of vocational high schools or junior and senior high schools who are not going on to the next level of the educational system. These institutes also provide training for experienced workers who need to transfer to a new occupation or who seek to upgrade their skills for promotions. The EVTA has also succeeded in expanding apprenticeship and other on-the-job training in industry. Besides training, it has devoted considerable effort to extend the testing of workers' skills in various trades; it has issued certificates to represent their levels of qualification.

In addition to these functions, the EVTA has established 7 regional Employment Service Centers and 37 Branch Offices, under provisions of the Vocational Training Act promulgated in December 1983. Among the Employment Service activities are included revision and development of vocational tests, collection and dissemination of occupational data, and establishment of a "National Employment Information Exchange Center" to help bring together job applicants and job vacancies. These latter activities bring the Employment Service into direct confrontation with needs for career guidance.

It is too early, of course, in the history of this organization to pass any judgments on its efficacy in handling career guidance. As far as training programs are concerned, efforts are apparently being made to fit them to economic and occupational projections. Making such projections is not within the sphere of responsibility of the EVTA or the Ministry of the Interior; rather, projections and other kinds of occupational information are taken directly from studies by the Economic Council. Presumably, the EVTA will disseminate such information to its clients. It is not clear, however, whether any effort will be made toward wider dissemination, such as might be accomplished through school and college counseling offices or

to the public at large. Meanwhile, counselors and counselor-educators have complained of the sparsity and fuzziness of occupational information that is available to them. They say they can get only spotty and unreliable information on such topics as occupational definitions and descriptions, requirements for entry, wages and salaries, opportunities for various personal satisfactions and rewards, conditions of work, and opportunities and outlook. In their view, the data provided by the Economic Council are not regarded as sufficiently comprehensive, systematic, or relevant for career guidance. It would seem advisable that counselors and career guidance specialists be consulted on the structure (and other characteristics) of the occupational information needed for guidance.

The development of employment and certification tests is evidently within the EVTA's province. It has contracted with a private institute of testing to construct the tests. So far, a translation and adaptation of the General Aptitude Test Battery developed by the U.S. Employment Service has been used on an experimental basis for guidance and counseling purposes. In a country so dependent on tests for selection, there is need for a word of caution on their use for guidance. Selection and guidance are not symmetrical processes. In selection of candidates for a given job, employers may care only about absolute validity of a battery of test scores in predicting success on the job: If the correlation coefficients are significant, selection of applicants with the highest scores on the predictor composite will increase productivity to a degree depending on the magnitude of the validity, the base rate, and the selection ratio. But if scores on a battery of tests are to be the primary basis for guidance on behalf of clients, as distinct from selection on behalf of employers, not just absolute prediction but differential prediction is required: That is, a client at a given level of education trying to choose an occupation needs to know how much better are chances of success in some kinds of work

than in others: With how much confidence can the available options be differentiated in this respect by a test battery? In general, as a great deal of research in the U.S. has shown, even test scores with useful absolute validity seem to lack sufficient differential validity to indicate which fields should be considered and which should be excluded. After the total number of occupations has been reduced to manageable proportions by an analysis of their desirability to each client, an evaluation of his or her abilities, skills, and knowledge in terms of the specific requirements of each of the remaining occupations is both more efficient and more beneficial to the client. Dependence on tests for guidance is also dubious in a culture where the transition from dependence on authority to individual autonomy has not yet been resolved. An agency that emphasizes use of tests for guidance may become identified with authoritarian selection on behalf of employers rather than with guidance responsive to each client's own career development. An appropriate role for use of tests in career guidance is proposed later in this paper under Recommendations.

Certainly the effort to set up an information exchange or "job bank" seems praiseworthy. The EVTA indicates (Ministry of Interior, undated) that in 1984 about half of all its applicants were placed in jobs, but less than a third of the job openings listed were filled. The actual number of placements seems to have been about 100 thousand. This aspect of helping people in the transition from school to work -- that is, bringing appropriate job openings to the attention of clients -- is of great practical value. It can enable candidates to be much more efficient in their job searches than they would be on their own. Obviously, its usefulness in job placement over the long term will depend largely on the extent to which the Employment Service can build its credibility with employers and candidates. This involves a "beneficent circle." If the

Employment Service can register a wide range of job openings and of clients, it will induce a high proportion of employers to list a high proportion of their jobs and encourage candidates with many levels and kinds of skills to register. Thus, many opportunities for "good matches" will be found, and usefulness of the Service will be widely accepted. If, however, mainly menial and unskilled jobs are listed, and unskilled applicants register, its effectiveness and reputation will be greatly curtailed.

An important asset for the potential efficacy of the EVTA is its opportunity for control over a number of related resources. It can coordinate and supervise career guidance, occupational information, testing and assessment, vocational training, and job placement. Thus, it possesses a unique capability to provide comprehensive services in the transition from school to work, or from one position to another. It can offer counseling to deal with career decisions and occupational choice; it can provide appropriate vocational training, and direct clients to it, as needed; it can refer clients to specific job openings, and then assist them in advancement through on-the-job training and certification. In short, the EVTA is positioned to play a major role in the transition from school to work in Taiwan, provided that it develops and uses appropriate resources wisely.

Recommendations for the Immediate Future

This paper has emphasized the rapid transition taking place in Taiwan from an authoritarian, tradition-bound culture to a more autonomous and open culture. Fast-paced changes in the economy and in the society at large have fostered more active individual involvement in CDM, greater flexibility and attention to self fulfillment. The universal acceptance of worth through kinship and of prestige through the singleminded pursuit of

more education has been giving ground to a growing recognition of wide-ranging variations in individual values.

The old model of career decision making involved following the dictates of parents (or other family elders), which often included aspiring to as high and prestigious a level of education as one could attain. School counseling has often emphasized resolution of internal conflicts engendered in students who have struggled to reconcile family dictates with their own perceptions of individual needs, values, opportunities, and circumstances; thus, counselor education has emphasized preparation to deal with problems of psychological adjustment and therapy.

The new times require consideration of a new rationale for guidance, along with new models of career decision making, new approaches to individual assessment, new developments in occupational information, new ways of linking the occupational domain to the domain of individual differences, new roles for testing and measurement -- in short, new strategies for career decision making and new methods of counselor education. These innovations obviously cannot be introduced without adequate preparation. Beginnings have already been made, but the needs are urgent, and the gradual evolutionary process appears to require speeding up. A brief statement of recommendations in each of the areas mentioned above follows.

1. Rationale for guidance. With changes in cultural premises and needs (of students, of the nation, of institutions, of employers), the purposes of guidance have to be redefined to emphasize guidance for career decision making as distinct from guidance for educational progress. A major purpose of education is to transmit the universals in a culture. Guidance, on the other hand, deals with choices to be made between the alternatives legitimized by a culture. As changes in Taiwan have made alternatives culturally acceptable, guidance theorists and practitioners

must undertake to encourage recognition of the choice points and discontinuities in careers, to define the options available at each stage, and to enhance individuals' freedom to make informed and rational decisions.

2. Model of career decision making. The major objective of informed and rational CDM is to maximize utility. That is, students and other clients will want to make choices that provide the greatest rewards and satisfactions, while avoiding excessive risks and investments. The first function of an appropriate model of guidance is to help each person narrow the staggering number and bewildering variety of occupations to a comprehensive but manageable list of options worthy of further consideration. The second function is to make finer distinctions between occupations on the list and so close on a choice that offers the optimum combination of desirability and probability for each person. The final function is to plan and engage in the actions necessary to implement the choice.

Perceptions of the importance and magnitude of various rewards, satisfactions, risks, and investments vary from one person to another. A given choice does not have uniform utility or expectancy for different individuals. Differences in the importance attached to any array of rewards and satisfactions are a function of individual values. So values are a central construct in a model of CDM. The model must also take cognizance of other individual differences that affect perceptions of the relative desirability of options or that restrict or facilitate access to various options. Since individuals differ also in the extent to which they are aware of these characteristics and are able to appraise and express them, self assessment is a major component of the model.

3. Self assessment. External assessment (as by standardized tests) is unenlightening for informed and rational CDM unless the results have

been understood and intercepted by the client. It is important, therefore, for clients to understand the domains of individual differences and their relevance for CDM. This requires attention to the particular structure of each domain and to clear definition of the dimensions comprised by each domain.

Thus, clients should not just be measured but should have an opportunity to explore and examine their own values and interests (which have to do with what they want or seek) and their own abilities, skills, knowledge, and resources (which have to do with what they can offer and the requirements they can meet). Research to help determine the structure of occupational values of people in Taiwan needs to be undertaken as soon as possible. Preliminary study indicates that such dimensions as money, prestige, altruism, security, autonomy, variety, and others are common to Taiwan and U.S. cultures. There may, however, be differences that can be identified by further research. Methods used in U.S. studies (e.g., Katz, 1974) should be readily transportable. The structure of interests and of abilities-skills-knowledge relevant for CDM can be determined in part by analyzing the structures of educational curricula and of activities represented in occupations in Taiwan. In general, self assessment of values can proceed from understanding definitions of each dimension, to initially quantifying the relative importance of each dimension to each client (e.g., by the client's use of numerical weights), then to checking those relative weights by direct comparison (i.e., resolving conflicts between competing values), and finally to redistributing the weights to reflect examined values. This kind of exercise, designed to make latent values explicit, can also be used to explore and examine interests: first by defining the structure of topics in educational courses and of activities in occupations, then by asking clients to rate their interests in each of these dimensions (topics and activities) and to compare and

revise the ratings across dimensions. Procedures for self assessment of abilities, skills, and knowledge can also capitalize on these two major resources: research into the structure of each domain, resulting in the presentation of carefully defined dimensions, and the vast experience of themselves that clients bring -- much more extensive than any battery of tests or inventories taken on a given day can provide.

Thus, the counselor or guidance system provides clients with information they do not have -- the structure and the definition of dimensions relevant to CDM -- and solicits from clients the information on which they are uniquely expert, their own accumulated experience of themselves.

4. Occupational information. Counselors who might want to practice career guidance in Taiwan have complained that the necessary information is not available. Again, as in individual assessment, structure is a crucial concept. A great deal of occupational information usually exists in most countries, but does not necessarily exist in a form that is properly organized and accessible for guidance. For example, information gathered for economic planning, the census, analysis of manpower needs, and so on often represents a high level of aggregation. For guidance purposes, this kind of information must be disaggregated by occupations or other options for choice. The first stage is to compile a list of appropriate occupations and their definitions. Occupational titles listed and classified for other purposes usually define and cluster occupations in ways that are more useful for their respective functions than for guidance. For guidance sometimes more or fewer titles are needed; some different titles should be merged into a single title; some single titles should be divided. But this means that information now available from government sources by industry or by some other grouping of occupations must be decomposed and then recomposed. Can the guidance profession

prevail upon government agencies to perform these additional analyses? Probably not without resistance, given the likelihood that career guidance needs are not well represented or understood by such agencies. But the guidance profession can make a good beginning on its own. So the second stage in developing occupational information is to determine an appropriate structure for such information.

This task can be a joint effort of faculty and students in the two graduate schools of guidance in Taiwan (the National Taiwan Normal University and the National Taiwan College of Education). First, these schools can form a task force to outline the kinds of information that are most relevant for career guidance. This outline would lead to framing the questions that need to be answered and then to specifying the form of the answer. Second, teams of students working in pairs, under close faculty supervision, could each make an intensive study of one occupation, using the structure that had been developed. This task could be done for credit, perhaps as part of a master's thesis. Each team's work would be reviewed by the entire task force (including faculty and students) for faithfulness to the structure. The team would acquire information by identifying and questioning an expert panel of participant-observers in the selected occupation. A panel would be composed of representative members of each occupation chosen as most likely to be knowledgeable not only about their own jobs but about the occupation as a whole. Thus, the panel for a given occupation might be distributed to include one person in industry, one in government, one in education, and so on. Staffs of occupational organizations and associations might be likely candidates for the panels, and they could also be asked to nominate others. Each team would combine and write up its panel's responses to questions in a format consistent with the structure determined for the information. Each panelist would then independently review the writeup of a given occupation for accuracy.

Panelists' comments and suggestions would be considered by the faculty supervisor and student team, who might go back to the panelists to iron out any disagreements or misunderstandings. This would be an iterative task, until consensus was reached. A separate faculty-student team would then do a final editing of the information for all the occupations studied, to make sure that style was consistent.

In this way, systematic and comprehensive information would be prepared about a handful of occupations. These writeups, in standard format, would then serve as models for a second wave of occupations. The models, along with a set of questions representing the structure, would be sent to new panels selected to cover other occupations. The new panels' responses would then be handled as in the procedure indicated above: combination of the various responses for each occupation, writeup, editing, review by the panel, ironing out of discrepancies, revision, and final editing. In this way, information could be accumulated for a core group of occupations, particularly those entered by substantial numbers. Other occupations could be added on a steady annual basis, and data for old ones could be reviewed and brought up to date periodically.

It has been my experience that panelists are glad to be asked to make this contribution to information about their own occupations. They take pride in their participation, and work at it diligently and seriously. The exercise would be valuable to graduate students: They would learn a great deal, not only about occupations, but about research and survey procedures, methods of analyzing data, and ways of converting "data" into "information." If at some point government agencies indicated a willingness to participate, or even take over full responsibility for gathering, analyzing, and reporting occupational information for career guidance, a model of an appropriate and useful system could be turned over to them.

5. Linking individual characteristics to occupational attributes. It is important to emphasize that the domain of individual characteristics is not isomorphic with the domain of occupational attributes. Nevertheless, the two domains can be linked. We spoke earlier of assessing individual characteristics that were relevant for CDM. Not all individual differences make a difference for this purpose. By the same token, some attributes of occupations are more meaningful than others for CDM. Various models have been used to establish linkages between the two domains. One has been to relate decision makers' characteristics to the characteristics of people already engaged in the occupations. (This model seems to express the "Birds of a feather flock together" rationale for guidance, a theory that has been quite thoroughly discredited.) Another has been to put full reliance on a particular array of dimensions associated with "interests," to the exclusion of other considerations. For example, the Guide for Occupational Exploration (U.S. Department of Labor, 1979) partitions the universe of occupations into "interest areas." This procedure assumes (erroneously) that no occupation involves more than one kind of interest (for example, engineering occupations, including research engineers, are classified in the "Mechanical" but not the "Scientific" area). It also assumes that interests are the dominant concern of decision makers. But of course other considerations than interests are important to decision makers, and such narrow trait-matching simply does not work.

Perhaps the practice of using "interests" loosely, as in the Guide, as if they characterized occupations, is responsible for inducing the error of the trait-matching model. Strictly speaking, interests are not a property of occupations but of persons. Activities can be used to describe occupations. Thus, the activities involved in an occupation tend to provide opportunities (more or less) for satisfaction of any of an individual's interests. But the match is not that of a square peg to a

square hole. Most of the occupations with which guidance is likely to be concerned tend to involve some variety of activities. While people in these occupations may be able to emphasize some activities more than others, in keeping with their own preferences, they are rarely able to limit themselves only to the activities that appeal to them. At the same time, and conversely, people usually have a "surplus" of interests beyond those that correspond to occupational activities. In short, it is clear that -- even when corresponding dimensions of interests and activities are identified -- the distribution of interests in the population is far from a perfect match with the distribution of related activities in the world of work.

Furthermore, occupational "families" determined on the basis of "interests" do not tend to represent cognate occupations in terms of properties that are at least equally important for CDM. Indeed, guidance -- by its nature -- requires not a single classification system, but flexibility such that occupations may be grouped into different clusters according to the needs, preferences, and characteristics of each client. Thus, a number of different "slices" can be taken through the universe of occupational attributes. We have previously mentioned the major kinds of individual characteristics relevant for guidance: values, interests, skills, and resources. Each of these can be usefully (but only partially) linked to a corresponding array of occupational attributes: values to the opportunities offered by occupations for various kinds of rewards and satisfactions; interests to the work activities of each occupation; abilities, skills, and knowledge to the requirements for employment in each occupation; and resources to the investment of time and money necessary to prepare for entry. For any one client, the linkage between individual characteristics and occupational attributes may involve only selected facets from each domain, but clients need the capability of

examining all possible linkages systematically before deciding which are most salient. As indicated below, an interactive computerized system can handle these linkages quite efficiently.

6. Strategies and algorithms. We have outlined above, in general terms, a two-stage model of CDM that helps the client first extract a manageable list of options from the universe of occupations and then make a choice that represents the optimum combination of desirability and probability. In the first stage, as suggested, each client may specify a distinctive array of search variables, usually the specific values and interests deemed most important for satisfaction. Occupations that meet or exceed the minimum specifications are retained for further consideration. In the second stage, numerical or graphic algorithms can be used to rate the extent to which each of these occupations offers the rewards, satisfactions, and activities that the client most wants, values, and likes. These ratings represent the desirability of each occupation. Then clients use information from assessment of skills and resources and from occupational information about requirements to rate the likelihood that they can enter and succeed in each occupation. These ratings represent probabilities. Various decision rules can be promulgated for modulating desirability with probabilities -- taking into account the risk-taking proclivities of each client and making sure that the basis for choice is explicit. This procedure, like the others summarized above -- assessing values, interests, skills; constructing and interpreting occupational information; linking individual characteristics to occupational attributes -- would require a great deal of a counselor's time in dyadic counseling. It would also require an encyclopedic breadth of knowledge and skill beyond human expectation. When the requirements of an important task seem to exceed human capabilities, developed or rapidly developing countries tend to turn to technological resources. Thus, the next section recommends

the development of a computer-assisted guidance (CAG) system for career counseling (Katz and Shatkin, 1983).

7. Computer-assisted guidance. The System of Interactive Guidance and Information (SIGI), developed by the author for use mainly in colleges in the U.S. (Katz, 1980), is now running on a computer at the National Taiwan College of Education. A new system called SIGI+, developed for the general adult population in the U.S. (Katz, 1984), is available for demonstration and study on a microcomputer resident in Taipei. These systems embody the principles, model, and components of career guidance enumerated above. Career guidance specialists in Taiwan have the opportunity to adapt these systems or to learn from them in order to develop an indigenous system. In these systems, clients engage in a dialogue with the computer. In various sections, they assess their own values, interests, and skills; through structured search, they identify a list of occupations that meet or exceed their specifications; by asking pointed questions of the data base and getting direct answers, they gain enriched knowledge of particular occupations; they examine the skills required for entry and success in designated occupations, and estimate their chances of meeting these requirements either immediately or after additional preparation; they look at the various pathways, required or recommended, for entry into designated occupations and rate their likelihood of completing the preparation; they consider practical problems and obstacles and judge whether they have the resources to cope with them; they compare selected occupations in terms of over-all desirability and probability, apply decision rules, and reach closure on their choices; finally, they plan and set out on the first steps necessary to implement their decisions.

In SIGI+, which is useful at any level from high school up, clients can choose their own paths through the system, using sections that are

appropriate at a given time and bypassing others. They can also work at chosen levels of detail and explanation, skimming over highlights or dropping down for closer scrutiny of some matters. Thus, a common structure is available for all clients but is flexible enough to meet widely different needs and circumstances.

In my recommendations to the National Science Council, I have outlined a developmental schedule and procedures for construction of such a system for Taiwan. Suitable hardware manufactured in the country is readily available at low cost. There is no dearth of computer programmers. Interest at the graduate schools of guidance is running high, and several faculty members are intent on undertaking the development of "courseware." It seems likely that the Employment Service of the EVTA will also want to participate in some way. Such CAG development would enable Taiwan to leapfrog over many of the problems (e.g., scant ratios of counselors to clients) that have prevented widespread and intensive application of this career guidance model in other countries.

8. Testing. The use of tests as gates to determine admission to successive levels of education, entry to occupations, and promotion and certification within occupations seems to be deeply embedded in Chinese culture. Tests in some form, therefore, seem likely to be used in gatekeeping functions for some time to come. The underlying doctrine of fairness and equality of opportunity is praiseworthy. There are problems, however, in the applications of this doctrine -- particularly in the construction and use of tests. While it would take too much space for the purposes of this paper to do justice to the problem, two main recommendations can be summarized.

The first has to do with test development and test quality. At present, tests are constructed for various uses by a variety of bodies. For example, regional tests for advancement from junior to senior high

school, national tests for college entrance, departmental tests for transfer from one college department to another, tests for admission to specific graduate schools, employment tests, and certification tests are the products of various people under the jurisdiction of a variety of agencies. This arrangement seems unnecessarily fragmented and diffuse, and may be responsible for the questionable quality of some of the tests. An alternative arrangement is proposed: the establishment of a single agency marshalling expertise in testing. This agency could assemble the best talent in the country in the science and art of measurement, and could develop tests of high quality for the various agencies and jurisdictions that use them. Content experts, such as college faculty members who now construct the College Entrance Examinations in different subjects, could continue to serve as committees of examiners. They would work closely with the measurement specialists on specification of content for each test in their own purview and on item writing, review, and revision. The various jurisdictions would be the clients of the new agency, and would continue to determine matters of policy. What the new agency would contribute would be technical expertise in testing and measurement. This would include not only cooperation with committees of examiners on the design of tests, the types of items to be used, and the writing of items, but also statistical analysis of items and tests, use of efficient scoring methods, development of appropriate scales, and -- probably most important -- the conduct of relevant research. Such research would encompass basic and applied studies; not least among the results of such studies would be the establishment of procedures for the interpretation and use of test scores, taking due account of continuing studies of their reliability and validity.

A second recommendation would be to avoid, for gatekeeping decisions, sole dependence on a single test or battery given at a particular time.

Research in other countries has demonstrated repeatedly the increase in validity contributed by use of complementary observations collected over a period of time. (Use of such accumulated observations also relieves much of the "do-or-die" pressure on students whose entire future otherwise seems to hang on a single day's testing.) A good standardized test is a marvelously efficient method of assessment. By carefully sampling some domain of ability, skill, or knowledge, scores on such tests can provide remarkably equitable, reliable, and valid predictors of success at various levels of education and even in some occupations. But there is almost always considerable room for improvement. Substantial increments in predictive validity almost invariably appear to come from records and ratings of previous achievement over a period of some months. These records and ratings themselves are often derived from series of less formal tests and observations: Individually, each such observation may be less reliable and valid than the formal admission tests, but the accumulation of many observations usually turns out to make a significant contribution to validity.

It may be possible to collect this multitude of observations in a systematic way. Here again computers loom as a useful technology to administer frequent tests (intermingled with instruction) and record and summarize the scores. A cumulative record of this sort for each person should be an effective adjunct to the formal admissions test scores obtained at the point when decisions are about to be made. One of the research functions of the testing agency proposed above would be to follow up students through various levels of education and analyze the regression of achievement on such variables as formal entrance tests and the cumulative record. This function should lead to improvements in both kinds of predictors and to their optimal weighting in predictor composites.

9. Counselor preparation. Finally, a word is in order about the preparation of counselors for their new roles in career guidance. The development of computerized systems will be largely in the hands of a generation of students now embarking on their preparation for counseling. The computer will never supplant counselors. It will be their creation, helping to extend the influence and impact of the most expert and knowledgeable members of the profession. Highly sophisticated counselors will be needed to develop the computerized systems, to define the role of such systems in career guidance, and to supplement them. This new generation of counselors will need to be conversant with models and functions of career guidance such as those described above. It will also have to be alert to technological developments, be flexible in using new technology, be comfortable with computers, videodisks, and the like.

To meet these needs the two graduate schools of guidance and the lone undergraduate department of guidance (at National Taiwan College of Education) will have to tool up to help counselors prepare for their new and expanded roles in career guidance. Although I developed and taught a graduate course in career guidance, it will be extremely difficul for current faculty members to pick up the teaching of the course entirely on their own and extend it into a comprehensive curriculum. By the same token, although SIGI and SIGI+ are now available on computers in Taiwan, it will be difficult for faculty members to adapt or emulate these systems without benefit of additional experience.

Thus, my final recommendation calls for establishing a formal exchange program whereby faculty members and graduate students from Taiwan can study and work abroad at institutions that have been in the forefront of developments in career guidance, computerized systems, testing, and related research, and foreign specialists in these fields can regularly

serve as visiting professors or conduct intensive workshops and seminars in Taiwan.

A Concluding Note

In writing this paper, I have been very much aware of my own limitations as an outsider. Obviously, an outsider's knowledge is not likely to be so surefooted in fact and intimate in understanding as an insider's. There is, however, a compensating advantage in perspective and detachment. The outsider's view may blur some of the details and may be insensitive to the traditions that underlie current practices. But the insider's closer focus on specific details and greater awareness of traditions may unduly narrow perception of options. A country that is in dynamic transition may find it useful to consider a broad view that is unencumbered by details and traditions. Recommendations derived from such a view should be, and are, offered with full recognition that they may be unacceptable in part or in their entirety. They are submitted, nevertheless, without undue diffidence, for what they are: suggestions based on short but intensive study by one who is greatly interested in the country and the subject; who is only too ignorant of the former but has had not inconsiderable experience with the latter; and who offers the recommendations, with the hope of stimulating dialogue, in a spirit of helpfulness and deep concern.

REFERENCES

Goode, W.J. World Revolution and Family Patterns. New York: Free Press, 1963.

Hsu, F.L.K. Under the Ancestor's Shadow. Garden City, N.Y.: Anchor, 1967.

Katz, M.R. Career decision-making: A computer-based System of Interactive Guidance and Information (SIGI). In Measurement for Self-Understanbing and Personal Development, pp. 43-69. Princeton, N.J.: Educational Testing Service, 1974.

Katz, M.R. SIGI: An interactive aid to career decision making. Journal of College Student Personnel, 1980, 21, 34-40.

Katz, M.R. Computer-assisted guidance: A walkthrough with running comments. Journal of Counseling and Development, 1984, 63, 153-157.

Katz, M.R., and Shatkin, L. Characteristics of computer-assisted guidance. The Counseling Psychologist, 1983, 11, 15-31.

Lin, H.T. Counseling services in Chinese society: A theoretical exploration. Journal of the National Taiwan College of Education, Volume 7, 1982.

Ministry of Education. Educational Statistics of the Republic of China. Taipei: Author, 1984.

Ministry of the Interior (Republic of China). Employment and Vocational Training Administration. Taipei: Author, undated.

United States Department of Labor. Guide to Occupational Exploration. Washington: Government Printing Office, 1979.

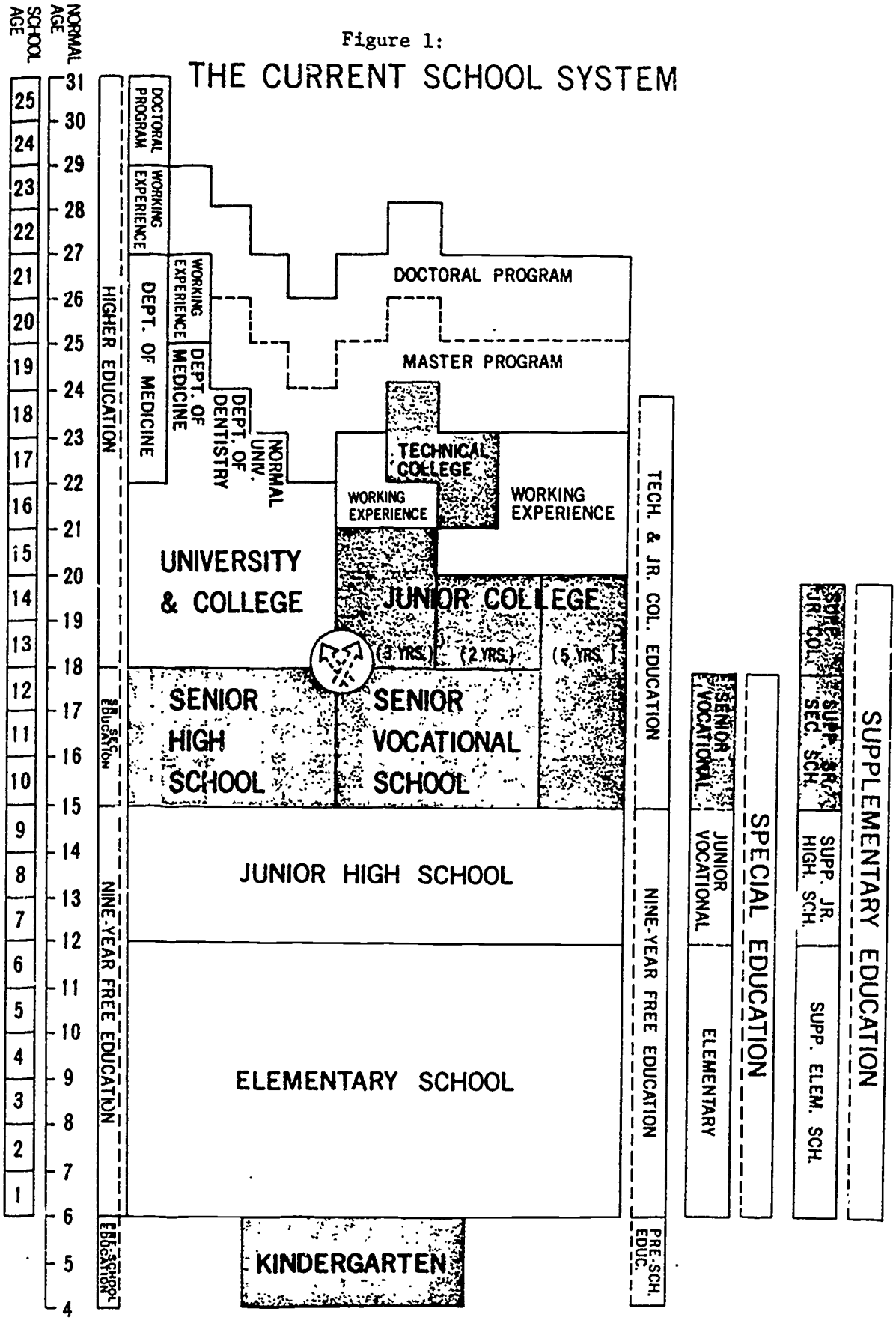
Yang, C.K. Religion in Chinese Society. Berkeley: University of California Press, 1961.

Author's Note

The author gratefully acknowledges the indispensable assistance generously given by Jane (Shu-Chen) Yang of the National Taiwan College of Education in gathering information about the educational system.

Figure 1:

THE CURRENT SCHOOL SYSTEM



(Educational Statistics of the Republic of China, Ministry of Education, 1984)