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Education of Gifted and Talented Students in Mainland China, Taiwan, and Japan.

Harold W. Stevenson, Shin-Ying Lee, &
Chuansheng Chen

The stunning success of Chinese and Japanese students in many areas of academic achievement has aroused a great deal of international interest in all aspects of education in the societies of East Asia. Although there have been many descriptions of their general educational practices, relatively little is known in the West about how these societies respond to students who are especially gifted academically or talented in areas such as the arts, music, or sports. We attempt to provide such information in this report.

By reading documents, talking to educational authorities, and visiting East Asia, we are able to discuss contemporary educational practices for gifted and talented students in Mainland China, Taiwan, and Japan. In the course of our investigation, we found answers to questions that are often raised about East Asian education. Can part of the academic success of Chinese and Japanese students be attributed to unusually strong programs of gifted education? Do these programs result in the modification of the regular curricula? What kinds of

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programs exist? Do the programs differ markedly among societies that espouse radically different philosophical and economic systems, such as is the case in East Asia? For example, do the practices fostered by the socialist government of Mainland China differ from those of capitalistic societies such as those of Taiwan and Japan? Attitudes and beliefs about giftedness vary widely among these cultures and the degree to which their educational systems attempt to accommodate gifted and talented students varies widely. As we will see, however, these attempts are not necessarily in line with those that we might expect.

Sources of Information

The information was obtained in several ways. Some of the information came from government reports written in Chinese and Japanese that are not available in the United States. Some came from reports, listed at the end of this article, that may be found in Asian libraries at several American universities. Very little has been published in English about East Asian programs for the gifted and talented. As a consequence, much of our information was obtained from interviews. During the summer of 1991, we interviewed Asian participants in a workshop on Asian Perspectives on Human Development held at the University of Michigan. These participants included leading experts in psychology and education from Mainland China, Taiwan, and Japan. In addition, during the fall of 1991, Shin-Ying Lee visited Taiwan, Kazuo Kato, a graduate student at the University of Michigan, visited Japan, and Harold Stevenson visited Japan and Mainland China. During these visits we conducted interviews with individuals highly placed in educational and scientific circles in Taipei (Taiwan), Tokyo and Sendai (Japan), and Beijing (Mainland China). In addition to the interviews, we collected any written materials related to the education of gifted children that were available in each country. Thus, our descriptions of the programs are current and are based on authoritative information although they cannot be confirmed by available quantitative data.

Mainland China

Schools in China, like schools throughout East Asia, follow a system of six years of elementary school, three years of junior high

school (lower middle school), and three years of high school education (upper middle school). The Chinese government has set the goal of achieving nine years of universal education by the end of the century, but it seems unlikely that this goal can be achieved.

In 1990, 97.9 percent of school-aged children were enrolled in elementary schools (State Statistical Bureau, 1991). Nearly all of these children complete six years of elementary school, but only three-fourths go on to lower middle school. Admission to lower middle school, and to all subsequent levels of education, depends upon the student's score on entrance examinations. Of those who finish lower middle school, fewer than 40 percent are able to continue their education in high school. Admission to universities is possible for approximately one quarter of high school graduates. In 1990, for example, universities admitted 609,000 of that year's 2.3 million high school graduates. In general, then, students entering first grade have about a 6 percent chance of entering a university.

The limited opportunities for advanced education produces intense competition among Chinese students, and current government policy is likely to increase this competitiveness. The policy is not to expand higher education, but to extend the reforms of primary and secondary education, improve the quality of education and the condition of schools at these levels, and raise efficiency. A current plan to restrict postgraduate education will further exacerbate the competitiveness that already exists. The goal for higher education in the future is to produce 25,000 masters degrees and 2,500 doctoral degrees annually from all fields.

Middle school students follow either an academic or vocational track, depending upon their abilities and aptitudes. The government has recently been working to increase enrollment in vocational schools to 50 percent of all upper middle schools throughout the country, and is striving to improve the number and quality of vocational teachers. At present, there are only 45.7 percent of the upper middle school students enrolled in vocational schools (State Statistical Bureau, 1991).

Special schools focusing on training in dance, music, fine arts, foreign languages, and athletics have existed intermittently in Mainland China since the 1950s. Generally, however, the education of gifted and talented students received little attention until the late 1970s. Before then, in line with socialist philosophy, educators and government officials de-emphasized the importance of individual differences in achievement. Also contributing to this lack of interest

was the disorder caused by the Cultural Revolution of the 1960s and 1970s, which seriously disrupted educational efforts of all kinds.

Education of gifted and talented students in Mainland China began to take a more discernible form in 1978 with the creation in Hefei of the first so-called "Youth Class" at the University of Science and Technology of China. By 1985, Youth Classes had been established at twelve other Chinese universities. From that time on, classes for gifted students began to grow, and in 1988 the first national conference on gifted education was held in Hefei.

The national government of Mainland China has had no policies or institutions that are concerned with the education and training of gifted and talented students. All activities both in and out of school for gifted and talented students depend on the organization of classes or programs by city or provincial governments. In-school programs take place alongside the regular curriculum. Out-of-school programs occur either in special schools or during evenings and weekends at the children's regular schools.

Out-of-School Programs

The three major purposes of programs for gifted students are summarized in the Chinese appeal: "*Zaochu rencai; kuaichu rencai; chu hao rencai*" (Produce talent early, fast, and of high quality). Admission to these programs is highly competitive, and can be accomplished through outstanding performance in national competitions, or by passing a battery of entrance tests. Depending upon the location and the program, families may or may not be charged tuition.

Efforts to educate children outside of school hours are predominantly of four major types: Olympic Schools that concentrate on mathematics, special schools for students talented in athletics and the arts, Youth Palaces that offer a wide array of courses, and summer and winter camps that typically concentrate on topics such as science, foreign languages, and computers.

Olympic Schools. The first "Olympic School" opened in 1982. Today there are 18 Olympic Schools serving third through eleventh graders throughout China. The largest is in Beijing with 2000 students. Inspiration for Olympic schools came from the International Mathematics Olympiad, where Chinese students have often been first- and second-place winners. It is a common belief in China that mathematics is the most important and basic science and that it is an area

in which Chinese students can become preeminent in the world. There is support for this belief: of the six Chinese participants in the 1990 Olympiad contests, five won a gold medal and one, a silver medal. Nearly all Olympic schools emphasize mathematical theory and problem solving, but some supplement courses in mathematics with classes in computer science.

Experienced elementary and secondary school teachers, as well as college professors, serve as instructors in Olympic schools. Teachers in Olympic Schools and national mathematics organizations create the teaching materials.

Special schools. In contrast to the short history of Olympic schools, after-school athletics schools (*yeyu tiyu xuexiao*) have been popular in China since the 1950s. Students admitted to these schools attend after their regular school day for approximately six hours each week. The schools emphasize basic physical skills and athletic techniques, and children are screened once a year to evaluate their progress. In 1956 there were 77 after-school athletics schools; by 1990 the number had grown to 3,685.

Regional and local governments have also supported special public "athletics elementary and middle schools" that have been set up to cultivate promising athletes. The curriculum of these schools consists of the regular academic curriculum for six hours a day and training in athletic techniques and theory for three hours a day. Generally speaking, parents prefer these schools to the after-school athletics schools, because they consider the faculty, facilities, and quality of students to be superior. Leading experts and scholars seek to devise curricula that will foster the creation of athletes who are competitive internationally and who are well-developed intellectually and morally, as well as physically. Admission is determined by assessment of the student's physical status and abilities, and by tests of academic achievement. The schools have been very successful: more than 80 percent of the Chinese medalists in the past several Asian Games were graduates of the two types of athletics programs.

After-school programs for students talented in the arts and music follow a pattern similar to that of the athletics schools. They include schools that train students in painting, sculpture, calligraphy, music, and theater.

Youth Palaces. China's Youth Palaces were begun in 1949 with the aim of cultivating students' interest in science and the arts. The Palaces were often housed in elegant buildings: the former residences of affluent families or in other buildings taken over by the govern-

ment. More than 1,000 are now in existence. In 1988, they were placed under the auspices of a newly formed government agency called the "National Association of Youth Palaces." Youth Palaces offer long-term, short-term, night, weekend, and holiday programs in a wide variety of subjects including music, dance, theater, calligraphy, photography, writing, computers, foreign languages, and model building. Each class lasts from six months to a year. Any student can apply for admission to one of the programs, but decisions about admission are based on the results of tests designed to select students who have acquired the basic skills and could benefit from the training.

Camps. Summer and winter camps offer programs similar to those of the Youth Palaces. Children are selected on the basis of tests and interviews and may attend camp for several weeks during the summer vacation or for one or two weeks during the winter vacation.

Other Activities. Supplementing the after-school programs are newspapers and magazines published especially for students interested in mathematics and science. These publications contain interesting problems and information beyond what is contained in students' textbooks. Weekly newspapers such as *Zhongxuesheng Bao* for middle-school students not only publish new material, but also feature innovative or novel solutions submitted by students for earlier problems. Similar publications also exist in Taiwan and Japan.

In-School Programs

In-school programs for gifted students also seek to produce talent "early, fast, and of high quality." To meet these purposes, students are admitted to various programs at an early age. For example, children as young as three can be admitted to elementary schools, eight-year-olds can enter middle schools, and ten-year-olds are able to enroll in colleges and universities. Further initiatives for shortening the years of education have been the reduction of the normal 12 years of primary and secondary education to as little as 8 years.

Youth Classes at Universities. Admission to Youth Classes is the most difficult among all of the programs for gifted students. Students must show extraordinary academic promise to be selected. The rigorous criteria for selection include high recommendations from their school or outstanding performance in a nationwide academic competition, high scores on a battery of standardized tests, and special written and oral examinations.

Reflecting the high criteria for selection, only 516 students have participated in the program at the University of Science and Technology of China between 1978 and 1990. Their average age was 14.7 years; the youngest were 11, and the oldest, 15. Among these students, 85 percent were boys, and the parents of approximately 80 percent of the students were classified as intellectuals.

Students in the program follow a special curriculum. A good deal of effort has been spent in preparing these curricula to ensure the proper integration of high school and college materials. For the first three years, these young students enroll in their own classes that cover introductory course work, including the basic courses in the student's major. In their fourth year, Youth Class students are allowed to enter regular courses in the department of their major. As a result of the students' high levels of ability and the care given to their education, their academic achievement tends to be higher than that of their university counterparts. For example, 72 percent of Youth Class students have gone on to graduate school either in China or overseas, compared with 5 percent of all university students.

Staff members at the Special Department for the Gifted Young at Hefei have studied the psychological characteristics of students in the Youth Classes (Zhu, 1991). The students had higher than average scores on measures of perseverance and independence, and possessed "normal physical development and strong physiques." They had high scores on tests of intelligence (an average score of 124 on the adult version of the Wechsler Intelligence Scale) and of creative thinking, high motivation for achievement, and low levels of test anxiety—characteristics that have been found in many other studies to accompany high academic achievement. Despite the students' high scores on measures of intelligence, Zhu concluded:

The early entrants are talented by learning, but not born "gifted children." The reason why they are different from other juveniles and enter college earlier at very young ages is that they begin to study on their own diligently when their age mates are unaware of the importance of and not good at studying independently. Therefore, an important aspect of developing the intelligence of the early entrants after primary or secondary schools is to foster, train, and improve their abilities of studying on their own (Zhu, 1991, pp. 17–18).

Gifted Programs in the Public Schools. China's first experimental class for gifted elementary school students opened in 1984. Only five- and six-year-olds were initially admitted, and the standard six-

year curriculum was taught in four years. This experiment was extended to middle schools in 1985. A four-year program which recruited gifted elementary students was implemented in lower middle schools. Students entering these classes were on the average under 10 years of age. At the same time, a two-year program was organized in upper middle schools for gifted students from lower middle schools. Students entering this program averaged about 12 years of age. Enrollment in these gifted programs made it possible to reduce the length of the normal twelve-year curriculum by two to four years.

In order to be considered for a gifted and talented program, a student is either recommended by his or her own school, or is brought to the attention of the school's authorities by demonstrating excellence in some regional or national competition, such as a mathematics contest or a science fair. Once nominated, the student then must excel on a battery of standardized tests covering both aptitude and achievement, and pass a physical exam. After passing this initial stage, the student must then undergo further testing by the school with the gifted program. This set of examinations—which includes both written work and interviews—is unique to each school because each school developed its own program for gifted students.

Programs for the Gifted in Mathematics and Science. Several high schools affiliated with universities established classes for gifted students in mathematics, physics, and chemistry in 1988. University professors carried out the actual classroom instruction with the assistance of the regular high school instructors. The organization of these special classes differs, depending upon the subject being taught. There is a one and one-half year program in mathematics that students enter after they have been in upper middle school for one year. Physics and chemistry programs have been available during the last two years of upper middle school. In each case, the students have continued with the regular high school curriculum in addition to doing 10 hours a week of additional work associated with the special course.

Problems and Perspectives

Educators and government officials in Mainland China point out many obstacles and difficulties that exist in the education of gifted and talented students. Psychological and educational measurement was unpopular for several decades. As a result, there are few systematic, standardized ways of identifying and developing appropriate

curricula for gifted students. A lack of budgetary support and administrative cooperation among different schools has meant that there is little interaction between gifted programs in different parts of the country or even among different schools in the same region. Little has been done nationally even to identify goals for the education of gifted and talented students.

The programs that do exist have been predominantly at the secondary school level, rather than representing a thoroughgoing effort to implement gifted programs at all levels of education. Some critics argue that programs for gifted students have often been misused, becoming nothing more than programs to help students prepare for college entrance examinations. Others have pointed out that, despite efforts to the contrary, programs for gifted students often inundate students with large amounts of information but fail to teach them how to reason or to think creatively. Current curricula are also criticized as lacking the depth and breadth of coverage that would be of benefit to gifted students.

The concern is often expressed in Mainland China and in other countries as well, that programs for gifted students impede the development of the whole individual. Mathematics and science are usually heavily emphasized and little attention is paid to the humanities. Chinese critics suggest that education for all students, including gifted students, needs to be more attentive to moral education, the fine arts, and physical education.

In addition, there is a concern that the unusual situation of being selected and labeled as a gifted student may result in uneven personality development, manifesting itself in such things as lack of responsibility, lack of respect for teachers, and lack of self-control. Parents are seen to share part of the blame for this. Some educators believe that parents often push their children too hard and place too much emphasis on success in academics at the cost of giving too little attention to other facets of their child's development. At the same time, they acknowledge that until the purposes of gifted education are more clearly defined for parents, it may be difficult for them to become involved in constructive ways.

Budgetary constraints have continually hampered efforts at education for the gifted in Mainland China. By the end of 1990, every college that had been running a Youth Class program, except the University of Science and Technology of China, had been forced to eliminate the program for financial reasons. Schools do not have the funds available to develop the curricula and facilities needed for gifted programs. Compounding these difficulties is the fact that

China faces a shortage of qualified teachers for all its schools and lacks the facilities to train additional teachers in significant numbers. It seems unlikely, therefore, that there will be a significant increase in the near future in the number of teachers qualified to teach gifted students or in the number of classes for gifted students.

The long-range future looks more optimistic. As the economy of China continues to expand and funds for education increase, opportunities for gifted and talented students are likely to grow. Whether or not there is an expansion of special programs, gifted students will benefit from future improvements in Chinese schools. The general quality of education in large metropolitan areas already is high and teachers employ pedagogical techniques that appear to be very effective. In research with urban children in Mainland China, Taiwan, Japan, and the United States, for example, Chinese children's scores on a battery of mathematics tests were as high or higher than those of children in the other locations (Stevenson, Lee, Chen, Lummis, Stigler, Liu, & Fang, 1990). Further improvements in educational facilities and in the quality of instruction should result in further advances in the Chinese students' remarkable levels of performance.

Taiwan

The history of education in Taiwan is closely linked with that of China and Japan. Taiwan, historically a part of China, was a Japanese colony for 50 years earlier in this century, during which time its educational system was very similar to that found in Japan. At the end of World War II, Taiwan was returned to China. Following the defeat of the Kuomintang government in 1949, Taiwan became the new home for over 1,500,000 mainland Chinese who brought with them the Chinese conception of an educational system and specific guidelines for its operation.

For the past several decades, Taiwan has been undergoing a transition from an agricultural to an industrial economy, and has given high priority to the development and expansion of its educational system. As occurs in other East Asian societies, economic success in Taiwan is closely tied to the acquisition of proper educational credentials. Because of this, getting a good education is considered to be the primary goal for all citizens during childhood and early adolescence.

Education is free and compulsory for all children during the first nine years of the twelve-year program of primary and secondary education. At the end of the nine years, students have several alterna-

tives. Most enter high school; others enroll in vocational or technical schools; some go to work. Currently, over 99 percent of the children in Taiwan attend elementary and junior high school; 84.7 percent of the graduates of junior high schools attend senior high schools or vocational high schools; 48.7 percent of the senior high and 12.9 percent of the vocational high school graduates continue further to colleges or universities (Bureau of Statistics, Ministry of Education of Taiwan, 1991).

Junior high school students compete by examination for entrance into various senior high schools or vocational schools. Each school is ranked according to its academic reputation, which is based on its success in placing students in top universities. Currently, admission to institutions of higher education is primarily determined, as it is throughout East Asia, by the students' scores on entrance examinations. The goal of the government, however, is to abandon the entrance examinations for senior high school by 1995 and to replace it with a new application procedure.

In the meantime, a significant proportion of students at the junior and senior high levels attend private "cram" schools called *bushiban*, as well as their regular schools. *Bushiban* have the single goal of improving students' scores on the entrance examinations by supplementing their knowledge and enhancing their skills in taking tests.

Programs for the Gifted and Talented

Active interest in providing special opportunities for gifted and talented students occurred relatively recently in Taiwan. Government and educational officials first became interested in the education of academically gifted students and of students talented in fine arts, drama, and music in the early 1960s. Shortly afterward, two elementary schools in Taipei opened the first classes for academically gifted students.

The government's interest in education for gifted and talented students grew out of recognition of the fact that a province with few natural resources must develop its human resources. Steps have been taken during the past several decades not only to improve education generally, but also to give greater attention to the education of all individuals with special needs (Wu, 1988, 1989). In 1968, compulsory education was extended from six to nine years, and accompanying legislation specified that special education was to be provided for gifted children. In 1971, an experimental curriculum was created in one elementary school at the fifth-grade level, with special en-

hanced curricula in mathematics, natural science, and the Chinese language. The project lasted for three years. Shortly afterward, the Ministry of Education began a six-year program throughout Taiwan for gifted elementary school students. The program was extended to the junior high level in 1979 and to the senior high level in 1982 (Special Education Association of the Republic of China, 1988). All of these programs are operated through the public school system; the government plays an almost exclusive role in setting up and funding special education programs.

Programs offered by the public schools for gifted and talented students are of three types: general programs such as those just described, programs in mathematics and science, and programs for students talented in the arts, music, and dance.

Students Gifted in Mathematics and Science. As has typically been the case throughout the world, special attention was given first to high-school students who showed special promise in mathematics and science. Special programs for these students were begun in 1983, in response to the growing concern by the government with developing scientific and technological skills in the populace. Students gifted in these fields have the opportunity to be tutored by college professors and in some cases are allowed to proceed directly to college following their second year of high school. Unusually talented students are allowed to enter college without taking the entrance examinations.

Students Talented in Music and the Arts. Special efforts to teach musically gifted students began in the early 1960s in a private elementary school in Taipei. It was not until ten years later that the first public elementary school in Taipei created a similar class. A recent survey revealed that music programs for talented students now exist in 28 schools; 29 schools have fine arts programs; and 18 schools have programs in dance. Especially talented students can also enroll directly in college departments of music and fine arts.

In addition to the in-school programs, out-of-school, extracurricular programs known as *cai yiban* have become popular in Taiwan. The curricula of these programs have little direct relation to the regular school program, but emphasize hands-on experiences in mathematics, chemistry, biology, and physics, as well as in creative writing, foreign languages, ceramics, and games like Chinese Go. The classes are open to all students but tuition is charged. These programs are especially popular among elementary school students.

Identifying the Gifted and Talented

Most gifted and talented students are first identified and recommended by their teachers. Next, in order to be accepted into a gifted or talented program, students must, according to national education law, (a) receive a score higher than two standard deviations above the mean on the IQ test given at the beginning of every school year, and (b) have a grade point average that is in the top 2 percent of their class or receive a score higher than one standard deviation above the mean on an achievement test covering all subjects in the curriculum.

In order to be considered gifted in the specific areas of mathematics or science, students must receive a score higher than one standard deviation above the mean on an achievement test in mathematics and science or on a test of intelligence or creativity. In addition, they must have a grade point average in the top 1 percent of their class in mathematics and science or have performed well in a national or international competition.

The criteria are equally stringent for students talented in other areas. They must receive an above-average score on an IQ test and a score at least two standard deviations above the mean on an aptitude test measuring their special talent. They also must have distinguished themselves in some national or international contest.

Once students have tentatively been identified as gifted or talented, a committee made up of teachers and administrators from the students' school submits a report to the education department of the local city government. After further screening by the department, qualified students are placed in appropriate special programs or schools.

Current Approaches

Currently, there are two main approaches to the education of gifted and talented students in Taiwan. In the "self-contained" approach, gifted and talented students are grouped together in one class and the standardized national curriculum is broadened in ways that will meet the needs of these students. The other approach is to keep students in regular classes but give them access to a special "resource classroom." Students in these classrooms receive tutoring to supplement the standard curriculum and have access to special materials (Lee, 1987).

The government has expanded the number of programs for gifted students greatly during the past decade. In 1991, 126 elementary

schools, 102 junior high schools, and 35 senior high schools were conducting programs for gifted students (Bureau of Statistics, 1991). More than 23,000 students participated in these programs—a four-fold expansion since 1982, when only 5800 students were enrolled.

For all programs, students must remain in the grade level appropriate for their age. According to the National Education Law, students who are deemed to be generally gifted and distinguish themselves in all areas of study are allowed to skip only one year in elementary school, junior and/or senior high school.

Students who are identified as being gifted in either mathematics and science, but not necessarily in other areas, have the opportunity to take part in special weekend programs and summer camps conducted by university professors. They also are allowed to take the entrance examination for the next higher level of schooling at the end of their second year of junior or senior high school. Alternatively, they may qualify to bypass university entrance exams altogether and move directly into science or mathematics departments in universities. Entrance is restricted, however, to mathematics and to pure science departments, such as chemistry or physics; gifted students are not given privileged entrance into applied programs such as engineering.

Problems and Perspectives

As Taiwan has continued to develop economically, the government has placed more and more emphasis on improving the quality of education. In fact, improvement of education is part of a new six-year national development project. Education for the gifted is likely to benefit greatly from this project, for the government considers the performance of gifted students to be an important indicator of the general quality of education being provided throughout the province. Moreover, education authorities also hope to use teaching methods developed for the gifted with ordinary students, especially methods for promoting problem solving and creative thinking.

The current system of education for the gifted and talented is not without its critics. Some object to what they consider to be a continuing over-emphasis on the very rigid examination system, which they believe undermines gifted and talented education. Gifted and talented students, for example, are often torn between preparing for the entrance examinations that are so important for their future success and developing their special talents, knowledge, and skills. Consequently, many parents and educators have become advocates

for comprehensive programs of gifted education that continue from kindergarten through college.

Another objection is that students gifted in mathematics and science should not be restricted to careers that emphasize only pure science. Some parents have actually kept their children out of such gifted programs so that they would have the option later of pursuing careers in other fields, such as engineering.

There are concerns, too, about the manner in which education for gifted students is organized. Debate continues about the relative merits of the "self-contained" and "resource classroom" approaches. Students in self-contained classrooms appear to perform better on tests of academic achievement and creativity than their counterparts assigned to resource classrooms. However, some critics have expressed concern about whether appropriate social and emotional development of students takes place in the self-contained classes, where social interactions are restricted to those involving other gifted students. There are also those who have complained that the curricula from the resource classroom and the regular classroom are not adequately integrated, and that trying to keep up with both overburdens students.

Other continuing challenges facing gifted and talented education programs in Taiwan include a lack of qualified teachers, the need for better selection devices, the paucity of competitions and scholarships for gifted and talented students, and the need to develop library and museum resources and other extracurricular activities to supplement classroom instruction.

Efforts are being made to expand special education training programs for teachers, including those who teach in kindergartens and in elementary schools, and to increase teachers' access to conferences and workshops on gifted and talented education. Education departments of colleges are being encouraged to develop full-fledged graduate programs to which practicing teachers can return for additional training, and explorations are being made for increasing the opportunities for teachers to go abroad to study practices in other countries that have developed programs for gifted and talented students. In order to attract more teachers to the field, officials are considering the possibility of supplementing the salaries of teachers of gifted and talented students.

Japan

Japan has no formal government programs aimed at cultivating the abilities of gifted and talented children. To understand why this is the case, it is necessary to consider certain aspects of Japanese culture and how these have influenced the development of the Japanese educational system.

Pre- vs. Post-war Education

After the Meiji Restoration in 1868, when Japan reopened itself to the rest of the world, the government began to revise and modernize its education system. Its model was the elitist European system in which families privileged by their economic or social status in society were more likely than ordinary citizens to enroll their children in school. Only nine years after the Restoration, 53 percent of the boys and 22 percent of the girls were enrolled in school. By 1919, when Japan was firmly established as an international power, the government realized it was necessary to make education open to all citizens. The Government Responsibility for the Basic Support of Compulsory Education Act was passed, making the national government accountable for the major educational expenses for the six years of elementary school. Students who pursued education beyond these six years were typically children of the social and economic elite.

Because the so-called "higher school" education involved relatively small numbers of students, curriculum guidelines were few and loose, and teachers had a great deal of freedom to structure the pace and the content of study. It is likely that gifted students received more attention than they do now, because teachers were in a position to cater to the interests and abilities of individual students.

World War II and its aftermath brought profound changes in the Japanese education system. With the advent of American influence during the occupation and the adoption of the postwar Constitution, the Japanese populace pursued the equality they understood to be a product of democracy and swept away old types of social privilege. Not surprisingly, education underwent profound changes. The elitist European system was abandoned in favor of what education leaders refer to as a "formal egalitarian" system of education.

Over 99 percent of children of compulsory school age are enrolled in school. Compulsory education exists through the ninth grade, but even after that, 96 percent of the students continue their education through enrollment in some form of upper secondary educa-

tion. Nearly 32 percent of Japanese high school graduates enroll in some form of higher education and 30 percent enroll in a vocational education program. Nearly all students entering the latter programs graduate (Monbusho, 1992).

The guiding principle of today's system is that students throughout Japan should have equal access to comparable school facilities. To ensure equal access, the national government covers half the cost of teacher salaries and teaching materials, and one-third of the cost of maintaining existing buildings. In addition, it provided between 18 and 19 percent of the cost for purchasing land and constructing new school buildings (Nihon Kyoiku Nenkan, 1992). The remaining expenses are the responsibility of local school districts. Education officials believe that this has served to create comparable teaching and learning conditions throughout Japan.

The administration of education in Japan, as it is in Mainland China and Taiwan, is highly centralized, and the Ministry of Education defines the content of textbooks and curriculum guidelines. The rationale for this degree of centralization is that only in this way will all students be properly equipped with the basic skills necessary for competition in contemporary society. Although teachers are given wide latitude in teaching the curriculum, there is a great deal of uniformity in the subject matter and skills that are taught throughout the nation.

At the elementary school level, the concern is not with identifying individual differences and singling out gifted students for special attention, but with providing all students with certain necessary skills. One former official told us he was proud of Japan's "very uniform and rigid primary school system" and went on to say:

Since a democratic society is a competitive society, we need to assure that they [the students] will have the basic skills they need to compete. As long as they have these basic skills, it is up to them where to go or how much effort they want to give in order to succeed in competition.

Special treatment, such as allowing a student to skip a grade, is extremely rare in Japan. Special classes for gifted students do not exist. Such classes would be regarded by both educators and parents as displaying unfair favoritism, thus violating the egalitarian philosophy on which the education system is built. Teachers often indicate that they do not especially appreciate having gifted children in their classrooms. The children they find more impressive are those who work hard. Besides, they say, gifted children only have the potential

(*senzai noryoku*), and should learn the importance of hard work: "If you don't polish the stone it will have no luster."

At the high school level, some efforts have been made to recognize and accommodate divergent student interests and abilities, but these have also met with opposition because they smack of "elite education." We frequently heard comments suggesting that if a certain group of students is treated differently, other groups will complain about not having equal opportunity.

In the last two decades, the Ministry of Education has tried to introduce more flexibility into the high school curriculum. The number of required courses has been reduced to allow students to pursue their own interests, and teachers have been granted more flexibility to meet students' individual educational needs. The Ministry of Education encouraged teachers to arrange classes according to student achievement so that all students would still be assured of learning the basic skills expected of high school students. To accomplish this, local schools were permitted to develop tracking systems, known as *syukudo gakkyu hensei*, in which a student would be placed in a slow, average, or fast class depending upon that student's previous performance in that subject. The system does not imply long-term assignment to a particular track; if a slower student's work improves, he or she moves up to a higher level. The basic content of the curriculum is the same in all tracks and conforms to the national curriculum; only the speed with which it is taught varies. To help slower students master the basic skills, the Ministry of Education proposed that these students should be taught by master teachers.

This system was fairly widely implemented after the "second baby boom" in the mid-seventies, when schools were faced with a large number of students with wide variability in ability and preparation. By the early 1980s, about 40 percent of high schools practiced some degree of tracking according to level of ability; however, it seems never to have gained popular acceptance outside the urban areas of Tokyo and Osaka. The major objection was that it appeared to be a return to an "elite" form of education.

After-School Activities

Special opportunities do exist in the public schools for students to enrich their education. After-school clubs and classes offer extracurricular activities that are open to all students. A high percentage choose to participate. During elementary school, students remain for an hour or more after their regular classes have ended; during high

school they may remain for several hours. The range of activities depends upon the size of the school, but includes such diverse topics as orchestra, calligraphy, computer programming, sports, literature, geology, biology, art, chemistry, and journal writing and editing. While these activities are not offered especially for gifted and talented students, they do offer students a broader scope of activities than those contained in the regular curriculum.

Kosei Kyoiku

Several of the experts and officials we talked to indicated that educators and the Ministry of Education are still concerned that Japanese high school curricula are too rigid. Recently, the Ministry has proposed what they call *kosei kyoiku*, which may be roughly translated as "individualized education." It is an attempt to encourage high schools to make their curricula more flexible so that the schools can do a better job of meeting the individual interests, abilities, and needs of the students.

What is meant by *kosei kyoiku* remains vague, and educators are not clear about what individualized instruction would encompass. The term *kosei* in Japanese carries more of a sense of individual differences in personality, rather than of individual differences in academic ability. Still, *kosei kyoiku* is quite different from conventional programs for gifted and talented students that seek out students with high academic ability. *Eisai kyoiku* is a direct translation of gifted education, but in our discussions a question was often raised about its goals. Would *eisai kyoiku* be defined by *noryoku*, a term describing capability, and usually implying mental capability? Would it include children characterized by *saino*, translated directly as talent? The question of whether *eisai kyoiku* should be directed primarily at promoting individuality, intellectual ability, or talent is not likely to receive a quick answer.

Elite Education vs. Gifted and Talented Education

In our conversations with Japanese education officials we sometimes found that they substituted the term "elite education" in their replies to our questions about gifted education. Discussion of special programs for gifted children seems to bring up images of the pre-World War II system of education based on the European models and restricted to students of socially or economically privileged families. Schools or programs that are organized to prepare the next generation of the elite to lead Japan are rejected in the egalitarian Japan of today.

Although entrance into the elite schools was not based upon ability, Japanese citizens apparently assume that the goal of special education of the gifted and talented is the same as that of the old elite system of education: to single out a group of students for special privileges later in their lives. The current social atmosphere in Japan is intolerant of attempts that even appear to subvert the post-World War II egalitarian system that now prevails in Japanese public schools. Each child, says the Japanese parent, should be given the same chance to gain high positions in society. Although parents and teachers recognize variation in ability among students, they generally believe that any student who works hard has the potential to be a high achiever. They justify the stratification of high schools and colleges by pointing out that all children were given equal opportunities during the first years of schooling. Some children responded appropriately to these opportunities by studying hard; others did not. It is not unfair, they argue, that those who have already demonstrated their diligence should have greater opportunities to benefit from higher levels of education than those who failed to show such devotion to their studies.

High School

Compulsory education in Japan extends through the ninth grade. High school attendance is not mandatory, although nearly all youths of high school age graduate from high school. In stark contrast to the egalitarian system that is strictly adhered to in elementary and junior high schools, a hierarchical order exists among high schools. High schools, especially in urban areas, are ranked into four levels according to their quality. The highest ranked schools are ones that have the greatest success in placing students in good universities; the lowest are those whose students specialize in vocational or technical education. "Can we say," an educator asked earnestly in one of our discussions, "that the Number One school provides *eisai kyoiku* (gifted education)?"

Students in Japan are admitted to a high school of a given level on the basis of results of entrance examinations. Competition for entrance into top high schools is keen because one's high school education has great importance for passing the examination to a good university. All students take the same high school entrance examination and in principle have an equal opportunity to enter a top high school. It is primarily through entrance examinations, first for high school and later for university, that individual differences in ability among students become acknowledged. But reference is also made to

the student's cumulative record (*naishinsho*). This record contains the student's grades in each subject, attendance record, teachers' ratings of the student's personality, and a description of extracurricular activities and behavior problems.

An alternative route to admission does exist in the case of college entrance. A certain percentage of students, sometimes up to one-fifth, are able to bypass the entrance examination system via the *suisen* (recommendation) system. It has been the practice, initially in private universities and now in public universities, to make a small number of places in each of their departments open to students from select high schools. Some universities might require an interview or a test of some type, but generally the students are allowed to avoid taking the stressful college entrance examinations.

Public universities have recently adopted and greatly expanded the *suisen* system. Rather than establishing relationships with specific high schools as they had in the past, departments in public universities set aside a few places to be filled by students with unusual qualifications. These include outstanding academic achievement or some other type of exceptional life experience, such as living overseas. The university interviews students who have been recommended by their schools and decides which ones to accept. Admission into these programs is competitive, but reliance on recommendations rather than scores on a college entrance examination has the potential of significantly modifying the way in which Japanese students gain entrance into universities.

Mention should also be made of private high schools. In addition to public high schools, private high schools are also popular, especially those that have good records in placing students in top universities. Private schools are able to pay greater attention to individual differences and to develop programs that will promote special talents and skills. Because they are more successful than public schools in instituting such programs, some of the educators with whom we talked suggested that private schools really might be considered to provide *eisai kyoiku*.

Juku or Supplementary Schooling. In order to compete more effectively on high school and college entrance examinations, students turn to *juku* (cram schools analogous to Taiwan's *bushiban*). *Juku* are entirely outside the official education system and are not supervised by the Ministry of Education.

In addition to self-improvement *juku* that teach such things as music, calligraphy, abacus, and martial arts, there are two kinds of academic *juku*. *Hoshujuku* provide remedial instruction for students

struggling with their schoolwork. *Shingaku juku* are the ones that specifically aim at preparing students for entrance examinations. The education officials we talked to generally expressed displeasure with the existence of *juku*, saying they felt that they too often emphasized material beyond what students at a given level should be expected to learn. Further, one person noted that this sort of *juku* created problems for egalitarian education:

Juku have begun to play the role of distinguishing among students by administering mock exams, the results of which could be compared to a large population of other students, thereby giving students an indication of their standing relative to others. Therefore, students began to discover divergences in ability among themselves by attending these *juku* because the regular schools refused to make such distinctions.

The main criticism of *juku* was from education officials who stressed that the official curriculum alone did a good job of equipping students with the appropriate skills. These officials expressed dismay that parents and students believed it was necessary to supplement an educationally sound curriculum with work in *juku*. Despite this view, attendance at *juku* is widespread, especially in large metropolitan areas. It is estimated that there are more than 35,000 *juku* in Japan, comprising an industry involving about six billion dollars a year (Adachi, 1988).

Possible Reforms. In addition to current discussions about how high schools might implement more individualized education, an interest in introducing reforms at the college level has also arisen. The Central Council for Education, an advisory body to the Minister of Education, has discussed modifications of entrance requirements to universities that might foster the development of students with special talents and interests.

Currently, students must make high scores on all aspects of the college entrance tests. This system selects students who have talent overall, but ignores those with special talents. The Council may propose that students who are gifted and talented in particular areas be admitted to universities even if they do not have high scores on the total entrance examination. A related recommendation would be to allow highly talented high school students to enroll in university courses in mathematics, physics, and a limited number of other fields. A third recommendation being discussed is to lower the age for university entrance below the currently legal age of 18—but only in the field of mathematics. No one has gone so far as to propose com-

prehensive programs for gifted and talented students such as those found at the secondary levels in Mainland China and Taiwan, and the idea of providing special opportunities to gifted students below the high school level is still considered to be inappropriate.

Problems and Perspectives

Predicting whether Japanese officials will ever introduce a broad system of special programs for gifted students is risky, but on the basis of contemporary Japanese philosophy and past educational practices it seems doubtful that this will occur in the near future. Special programs for gifted young children are unlikely to flourish in a culture where elementary school teachers would never tell parents directly that their child is gifted or advanced over other students and where there is assiduous avoidance of direct forms of teaching academic subjects in nursery schools and kindergartens for fear that it would produce inequities in first grade. Teachers may provide subtle forms of encouragement to bright students by encouraging them to apply to good high schools, and indirect forms of teaching by parents and teachers may occur before children enter school, but there is general avoidance of discussion of innate differences in ability. Even in high school, teachers do not praise especially sophisticated or straightforward ways of solving problems if the solutions are not dependent upon what has already been taught. Regardless of whether students have learned advanced mathematics on their own or whether they have already read the material that is assigned, they are given no opportunity to skip the classes which cover these topics. The major accommodation occurs in those high schools where such students are placed in the fast track. These students complete the regular assignments during the first half of the year; the second half is devoted to study of enrichment materials. In addition, students are assigned optional classes on the basis of the subject on which they are concentrating. For example, students emphasizing the natural sciences are assigned advanced courses in mathematics, physics, and chemistry; those concentrating on the humanities and social sciences are more likely to be assigned courses in English and Japanese.

Some tension exists within Japanese society between egalitarian education and gifted education. One persistent theme is that all children should be given equal opportunities for a good education, but there is also the counter theme that, like Mainland China, Japan should be producing students "earlier, faster, and better." The home-study Kumon lessons and the Suzuki approach to early musical

training have become very popular as means of enhancing public education for children. Even the Chairman of the Sony Corporation has entered the argument by suggesting in a widely read book that kindergarten is too late for initiating formal education (Ibuka, 1977). Whatever form education of the gifted and talented may ultimately take in Japan, one thing appears to be sure: gifted education will not be part of the government-sponsored educational system, but will be something that highly motivated parents will provide for their children through private lessons.

Japan is a society in which children are exhorted to study hard and are told that if they apply themselves they will be able to achieve. The great emphasis on effort and the purposeful de-emphasis of innate abilities has paid off in terms of the remarkably high average levels of academic achievement and indirectly in the country's outstanding economic success. But the Japanese are beginning to worry about why they are not producing larger numbers of basic scientific discoveries and more Nobel prize winners. Educators are especially concerned about how they can stimulate greater creativity and better problem solving in their students. Any discussion of education in Japan inevitably turns to these topics. How these worries and concerns may influence educational practices for gifted and talented students in Japan will be interesting to observe in the coming decades.

Summary and Conclusions

Programs for gifted and talented children in East Asia are new; the majority were established during the last decade. The most vigorous efforts are being made in Mainland China and Taiwan. Mainland China, with its need to modernize, and Taiwan, aware of its delicate economic position as a result of scarce natural resources, have promoted education as a means of advancing their societies. In this effort, the local education authorities in Mainland China and the government in Taiwan have introduced a wide array of programs for gifted and talented students during the regular school day and after school. Japan supports no programs specifically for gifted students prior to the high school years.

Political philosophy is obviously not a critical factor in determining whether programs for gifted students will be established. The socialist government of Mainland China promotes egalitarianism, but it also believes that well trained scientists, mathematicians, and other professionals are important for the advancement of the coun-

try. The government assumes that the best way to develop such individuals is to nurture students who give evidence of outstanding abilities. Japan, on the other hand, had bitter experience with social elitism before World War II, and since then has taken vigorous steps to avoid the emergence of groups that would dominate the political and social life of the country. As a result, Japan makes strong efforts to ensure that all children begin school with equal knowledge and receive equal educational opportunities during their elementary school years. The Japanese explain that some children emerge as more effective students than others, but this occurs not because of their exceptionally high innate abilities or high social status, but because they have taken advantage of their opportunities and worked hard in school. Thus, high schools serving only highly able students are justified because these students have already shown that they are more likely to benefit from a more demanding curriculum than their average peers.

As far as we can tell from many hours of observations in the schools of Mainland China, Taiwan, and Japan, the formal policies are carefully adhered to by educational administrators and teachers. There is no denial of innate differences in ability, but in both Chinese and Japanese cultures, emphasis is placed on the importance of effort as the ultimate factor that differentiates the level of achievement individuals attain. "The slow bird must start out early," say the Chinese. "*Yareba dekiru*," say the Japanese: "If you work at it you can do it." These are optimistic beliefs, and underlie the expectation that all normal children are capable of performing effectively in school. The secret of academic success lies in having devoted teachers and supportive parents—but most importantly in hard work of the students themselves. Chinese and Japanese educators and psychologists tell us they cannot understand why Westerners place such importance on innate abilities. They consider this a self-defeating emphasis, one that potentially limits the achievement of average and gifted students alike. Average students may begin to doubt that they can succeed even if they do work hard, and gifted students may come to believe that their high abilities alone are sufficient for ultimate success.

A common question about effort-oriented philosophies is how gifted students continue to be motivated to study. Gifted students in Mainland China and Taiwan have many opportunities to work at levels beyond those demanded by the standard curriculum. It is a potential problem in Japan, where no special academic opportunities other than *juku* are typically available to gifted children. However, Japanese teachers use an interactive teaching technique in which

they attempt to elicit information from students, rather than providing it themselves through frequent lectures. In seeking information from the class, they allow gifted students to share innovative ideas and explanations with their classmates. During elementary school, classes are divided into *han*, small, heterogeneous groups that work together on problems. The more advanced students in the *han* assist other students who may be having difficulty. By high school, gifted students are separated into different schools in accordance with their level of academic achievement.

From our survey it appears that neither level of economic development nor the quality of schools and universities determines whether or not programs for the education of gifted and talented students will be established. The critical difference is the culture's philosophy of education. In an effort to promote egalitarianism, all elementary school students in Japan are required to remain with their classmates regardless of their level of intelligence or of academic achievement. In contrast, Taiwan and Mainland China, seeking to enhance the contribution of gifted and talented students to their societies, have developed elaborate programs of special education. The natural experiments that are taking place in these cultures will provide information about gifted and talented students that will be of interest throughout the world.

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