CHAPTER 10

China's Statistical Education

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10.1 INTRODUCTION

The People's Republic of China is a socialist country with a territory of 9.6 million square kilometres and a population of 1.03 billion. The Chinese government pays much attention to education and the State Council has under it the State Education Commission, while the ministries and the people's governments at various levels have under them special departments in charge of education. The education funds come mainly from the allocation of the people's government at various levels. At present, China is reforming its educational system, with the aim of raising the cultural level of its people and producing many qualified personnel.

Statistical education, a component part of China's education as a whole, is now being reformed, too. The organisation responsible for coordinating the work of statistical education throughout the country is the State Statistical Bureau, under which there is the Department of Personnel Affairs and Education.

10.2 PROFESSIONAL AND UNIVERSAL EDUCATION IN STATISTICS

Statistical education consists of two parts: professional education and universal education. By professional education is meant the training of professional statisticians. By universal education is meant the popularising of basic statistical knowledge among people in other occupations. Professional education in statistics is subdivided into two parts: higher education and secondary education.

10.2.1 *Higher Education in Statistics*

Higher education in statistics at universities and colleges is aiming at training senior and middle ranking statisticians. Students are senior middle school graduates with 12 years of schooling. They study under a two-year polytechnical programme and a four-year regular programme. Graduates of the second programme receive a B.A. degree in statistics.

At present, China has 74 universities and colleges that have departments or disciplines of statistics, with a total enrollment of 10,600

students. This year, 1,500 students will graduate, and 900 with B.A. degree. There are 35 universities and colleges offering master's programme, with a total enrollment of 387 post-graduates. Of the 74 universities and colleges that have departments or disciplines of statistics, four are under the direct leadership of the State Education Commission, and they now have 600 students majoring in statistics. Under the leadership of other ministries and commissions, there are 24 universities and colleges with a total of 4,000 students majoring in statistics under the leadership of local authorities, with a total of 6,000 students majoring in statistics.

The State Statistical Bureau set up a statistical institute in Xian in 1984, with a scheduled enrolment of 1,630 students. The institute admitted students in 1986. In 1983, in cooperation with the State Planning Commission and the State Goods and Materials Bureau, the State Statistical Bureau established a planning and statistical college affiliated to the Chinese People's University. The college has 400 students majoring in statistics. In 1983, the State Statistical Bureau entrusted the Nankai University and the Fudan University to set up the disciplines of mathematical statistics, in which there are now 240 students. In 1984, the State Statistical Bureau again entrusted the Shanghai University of Finance and Economics to set up the discipline of modern applied statistics, with stress on studying the statistical methods of western countries. It now has 40 postgraduates, and 100 undergraduates. In 1985, the State Statistical Bureau entrusted Beijing University and the Research Institute of Applied Mathematics of the Chinese Academy of Sciences to admit postgraduates to study master's programme. In the future, the State Statistical Bureau will concentrate on the training of senior and middle ranking statisticians and leave the training of junior statisticians to the statistical bureaus at local levels.

Most of the departments or disciplines of statistics are regarded as liberal arts departments or disciplines while the remainder are regarded as science departments or disciplines. The statistical courses in the former departments or disciplines will put stress on the study of socio-economic statistics. The curricula include: philosophy, political economics, mathematical analysis, higher mathematics (including calculus and theory of probability), accounting, theory of planned economy, theory of socio-economic statistics, economic statistics, statistics of different sectors of the national economy, mathematical statistics and the use of computers. The statistical courses in the latter departments or disciplines will place stress on the study of the theory of probability and mathematical statistics. The curricula include: philosophy, political economics, mathematical analysis, higher algebra, linear programming, theory of probability, statistical inference, sample survey, economic statistics, and computer language. In order to have a clear understanding of the curricula, we will give as appendices the statistical courses of the Chinese People's University, the mathematical statistics programme for undergraduate students of the Nankai University and the postgraduate applied mathematical statistics programme of the Shanghai University of Finance and Economics.

10.2.2 *Secondary Education in Statistics*

Secondary statistical schools are responsible for training junior statisticians. At present, China has 222 secondary polytechnical schools having statistical disciplines, with a total enrolment of 21,000 students. There are two kinds of such schools: one admitting junior middle school graduates with nine years of schooling for three to four years of further study in statistics, and the other admitting senior middle school students with 12 years of schooling for two more years of study in statistics.

The State Statistical Bureau has one secondary statistical school, the Sichuan Statistical School, which now has 800 students. Ministries and other bureaus under the State Council have established statistical disciplines at 14 secondary polytechnical schools, with a total enrolment of 2,800 students. The provinces, autonomous regions and municipalities throughout the country have established statistical disciplines in 207 secondary polytechnical schools, with a total enrolment of 17,400 students. In recent years, all the provinces, autonomous regions and municipalities have made plans to set up their own secondary statistical schools. Beijing, Shanxi, Henan and Jiangxi have already had their own.

As seen in their teaching contents, the secondary statistical schools have put stress on applying statistical knowledge into practice. Their curricula include: political economics, Chinese language, mathematics, theory of statistics, computing techniques and statistics of different sectors of the national economy. Apart from classroom teaching of statistics, these secondary statistical schools give students more time to do field work.

Since there is a greater demand for junior statisticians in society than these secondary statistical schools can produce for the time being, a group of regular senior middle schools have started a three-year statistical programme to teach students basic statistical knowledge before they are employed. After graduation, most of these students are employed by enterprises or public institutions to do statistical or economic management work at the grass-roots. So far no accurate investigation has ever been done into the situation of these students. Curricula vary from one school to another.

10.2.3 *Universal Education in Statistics*

Statistics is widely used. Not only statisticians but other specialists like engineers, agro-technicians, economists and accountants should have statistical knowledge. Even workers, farmers and other working people need to know statistics. Therefore, statistical education not only needs a professional teaching programme but also a popularisation programme. At present, China has adopted the following measures to popularise statistical knowledge:

First, teaching basic statistical knowledge to junior middle school students. China's junior middle school textbook of mathematics contains a chapter called *Basic Statistics*, which deals with basic sample survey knowledge about population, sample, mean and variance.

Second, offering statistical courses in ordinary secondary polytechnical schools. In all the secondary polytechnical schools throughout the country, there are now 180,000 students studying finance and economics. These students are required to study statistical courses. In disciplines of engineering, agriculture, medicine, etc. there are also statistical courses.

China's departments concerned have paid much attention to popularising statistical knowledge. The State Statistical Bureau has recently suggested to the State Education Commission that not only the middle school textbook but also the primary school textbook contain some statistical knowledge.

10.3 CADRES' IN-SERVICE TRAINING IN STATISTICS

In recent years, because of the rapid development of China's statistical work, a large number of people without any training in statistics have participated in statistical work. In the government statistical system alone, the number of people who are engaged in statistical work has increased from 28,000 in 1980 to more than 50,000, bringing the total number of China's statisticians to more than 1 million. Most of these newly recruited staff members did not receive any professional training in statistics. Even though some of them received some kind of professional training in statistics, their knowledge about statistics needs to be updated. Therefore, it is necessary to retrain all the statisticians throughout the country.

In order to bring the enthusiasm of the statistical departments at various levels into full play, the State Statistical Bureau has established the principle of giving statisticians in-service training level by level. The State Statistical Bureau is responsible for the leadership and organization of all the training throughout the country. It is also responsible for training the leaders of the statistical bureaus and statistical departments of the provinces, autonomous regions, municipalities, prefectures (cities), ministries as well as some of the young and middle-aged statisticians and cadres in the State Statistical Bureau itself. The statistical bureaus of the provinces, autonomous regions and municipalities are responsible for training the leaders of the county statistical bureaus as well as other statisticians. Ministries are responsible for training statisticians of their own.

The principle determining the content of training at various levels is 'learning what is needed or what one lacks'. With regard to those statisticians at the grass-roots level, they should put stress on studying the basic theory of statistics and techniques. As for leading cadres, they should place stress on learning the theory and methods of statistics of various trades and lines and studying how to improve them, and make them all the more perfect. Generally speaking, all the statisticians are required to study the theory of sampling, the theory of input and output, mathematical statistics, basic knowledge about computers and other modern statistical knowledge.

The forms of training are flexible, diverse and according to local conditions. Years ago, short-term training was the major form, which took one month or three months for the shortest, and six months or a year for the longest. According to a survey in the country's 12 provinces, 327 training classes were held and 22,000 statisticians retrained in 1982. In addition to short-term programme, long-term training was initiated in 1985 in such forms as special statistical classes, television and correspondence statistical colleges.

By special statistical classes is meant sending those young cadres, who have received senior middle school education and worked for years, to the departments of statistics in universities and colleges for two years of further study. These students, after finishing their two years of study, go back to where they once worked. In 1985, the State Statistical Bureau enlisted 220 students to be trained at the Planning and Statistics College of the Chinese People's University and the Xian Statistics College. In addition, the statistical bureaus of Beijing, Shanghai, Anhui province and the Xinjiang Uygur Autonomous Region entrusted some universities and colleges to train statisticians on their behalf. In 1983, the State Statistical Bureau and the China Central Television Station co-sponsored a telecourse on the theory of socio-economic statistics, with an official enrolment of 580,000 students, of whom 237,000 have graduated with diploma. In 1984, they co-sponsored another telecourse on the basic knowledge of statistical mathematics, with 340,000 participants, of whom 190,000 have graduated with diploma. Basing themselves on these two telecourses, they co-sponsored the China Statisticians Television Correspondence College in 1985.

Led by the State Statistical Bureau, this college has branch colleges affiliated to the statistical bureaus of the provinces, autonomous regions and municipalities, and also has working stations at the prefectural (city) and county levels. Mr. Xue Muqiao, a famous economist in China, is the honorary dean, and Mr. Zhang Sai, director of the State Statistical Bureau, is the dean of the college. The leaders of the statistical bureaus at various levels are the deans or leaders of the branch colleges or working stations. So far 305,000 people have applied for the college system's 7,000 classes. It has more than 1,000 faculty and staff members and about 6,000 teaching assistants. The college system follows the educational programme of statistics formulated by the All-China College Examination Committee for the Self-taught. The college system invites professors to give lectures. The All-China College Examination Committee for the Self-taught holds an examination when a course is completed and issues diplomas, equivalent to those of polytechnical college graduates, to those self-taught students when they pass examinations for all the curricula. At present, the curricula for a three-year programme include theory of statistics, economic statistics, higher mathematics, philosophy, political economics and six other courses. Those graduates with diplomas are required to study another two-year programme of mathematical statistics, computer techniques and other courses before they reach the level of a regular college graduate.

While offering in-service training to statisticians, we have paid attention

to learning other countries' experiences in our exchanges with them. The State Statistical Bureau has organized six training classes, for which experts from the United Nations, the Statistical Institute for Asia and the Pacific (SIAP) and the Japanese Statistical Bureau were invited to give lectures to more than 300 people. In addition, the State Statistical Bureau has sent groups of students and scholars to study in the United States, Japan, the Federal Republic of Germany, India, France, the Soviet Union and many other countries.

10.4 THE CONTINUATION OF STATISTICAL EDUCATION

Most of the graduates of statistics from the universities and colleges do practical work in statistics, and a small portion do statistics research and teaching. The Research Institute of Applied Mathematics and the Research Institute of Systems Science of the Chinese Academy of Sciences have their own statistics research offices, and their computer centres have probability and statistics groups conducting research on the theory of probability and mathematical statistics. They are also responsible for training senior specialists in these fields. The State Statistical Bureau has under it the Research Institute of Statistical Science conducting research mainly on socio-economic statistics. This institute is now doing research on the theory of statistics, index systems, survey methodology, prediction, statistical education and history of statistics. Its research results, prepared in the form of teaching materials, have greatly promoted the development of statistical education. The State Statistical Bureau's Research Institute of Statistical Science has organized professors to write a series of statistical textbooks for universities and colleges. The Bureau's Department of Personnel Affairs and Education organized teachers to write a series of statistical textbooks for secondary statistical schools. Other scientific research centres, institutes of higher learning and some secondary statistical schools have also prepared some statistical textbooks.

The National Statistical Society of China is a non-governmental academic organization. It was found in November 1979. Adhering to the principle of applying theory to practice and allowing a hundred schools of thought to contend with each other, the Society does research on the theory of statistics, and on China's statistical systems, methods, techniques in comparison with other countries', so as to raise the scientific level of China's theory of statistics and build up statistical work with Chinese characteristics. One of its major tasks is to co-operate with the departments concerned to strengthen China's statistical education and make Chinese statisticians professionally more proficient. The National Statistical Society of China has eight research groups, including a research group of statistical education. The Society publishes *Statistical Research* (bi-monthly) and the *Newsletters from the National Statistical Society of China* (irregular).

10.5 PROSPECTS FOR CHINA'S STATISTICAL EDUCATION

The Chinese government has paid much attention to the work of statistics. In December 1983, the National People's Congress of the People's Republic of China approved the Statistics Law of the People's Republic of China. In January 1984, the State Council promulgated the Decision on Strengthening Statistical Work. All these documents put forward the tasks for modernizing China's statistical work, called for the use of advanced statistical science and modern computing techniques to transform and update China's statistical work, so as to have a complete indicator system of statistics, to standardize China's statistical classification, to conduct statistical surveys in a scientific way, to regularize China's basic statistical work, to modernize China's statistical computing and data transmission techniques and to offer good service in statistical work. For all these purposes, it is necessary to energetically develop and revamp China's statistical education and build up a stable, well-trained contingent of statisticians who have a good grasp of modern statistical science and multifarious skills. The task of statistical education is just to build up such a contingent. The construction of such a contingent requires efforts over a long period of time. It is estimated that within five years China will need every year more than 5,000 college graduates in statistics and more than 45,000 graduates from secondary statistical schools. The present scope of education, however, falls far short of this demand. Therefore, China has to make great efforts to develop her statistical education. So far as teaching programmes are concerned, China has to strengthen the education in higher mathematics, mathematical statistics, electronic computing and transmission techniques, while strengthening and improving its education in socio-economic statistics. We wish to strengthen our exchanges with other countries in statistical education and learn their advanced experiences, so as to modernise China's statistical education and build up China's own system of statistical education, which will fit well into China's statistical work. We also hope that China's statistical education will turn out more and better statisticians so as to better serve the modernization of China's statistical work.

APPENDIX I *Program of the Department of Statistics for undergraduate students at the Planning and Statistics College, Chinese People's University*

Codes	Courses	Hours	Remarks
1	Philosophy	90	
2	Political Economics	180	
3	History of the Chinese Communist Party	90	
4	Foreign Language	288	
5	Physical Culture	206	
6	Mathematics for Economics	270	
7	Chinese-Language Writing	72	
8	Fundamentals of Data Processing	144	
9	Logic	54	Elective courses, selected two from the three
10	Elementary Applied Chemistry	72	
11	Applied Physics	72	
12	Elementary Natural Sciences	72	Elective courses, selected one from the two
13	An Introduction to Modern Scientific Knowledge	72	
14	Accounting	78	
15	Theory of Finance	54	
16	International Finance	54	
17	Economy of the Soviet Union and East European Countries	54	Elective courses, selected two from the three
18	Economic Law	54	
19	Modern Bourgeois Economic Theory	54	
20	Theory of Planned Economy	124	
21	Fundamentals of Production Distribution	72	
22	Application of Mathematical Statistics in Socio-Economy	108	
23	Fundamentals of Socio-Economic Statistics	108	
24	Economic Statistics	124	
25	Overall Balance Statistics (including input and output analysis)	72	
26	Statistical Analysis and use of computers	62	
27	Economic Statistics of Foreign countries	39	

28	Lectures on Statistics of Different Sectors of the National Economy	144	Required for students studying specialized statistical topics
29	Marxist Theory on Social Re-Production	54	
30	History of Statistics	48	
31	Symposium on Statistics	36	
32	Cybernetics	54	Required for students studying the the application of mathematical statistics in socio-economy
33	Theory and Practice of Sampling	54	
34	Regression Analysis and Its Application	54	
35	Product Quality Control	36	
36	Statistical Prediction	48	
37	Lectures on the Application of Mathematical Statistics	36	
38	Selected Works of Lenin on Statistics	52	Elective courses selected two two from the four
39	Management of Agricultural Enterprises	72	
40	Management of Agricultural Enterprises	72	
41	Management of Commercial Enterprises	52	

Total Hours	2,911
Required	2,481
Elective	430
Scientific Research	10 weeks
Participation in Labour	6 weeks
Social Investigation	11 weeks

APPENDIX II *Programme of the Discipline of Mathematical Statistics for Undergraduate Students, Department of Mathematics, Nankai University*

Codes	Courses	Credit	Hours	Remarks
1	Communist Ethics		136	The first 16
2	Political Theory	9	153	courses are
3	First Foreign Language	16	340	required
4	Physical Culture	4	136	
5	Mathematical Analysis	17	340	
6	Higher Algebra	10	204	
7	Analytic Geometry	2	51	
8	Theory of Functions	6	102	
9	Theory of Probability	4	85	
10	Mathematical Statistics	4	85	
11	Computer Language	3	51	
12	Computing Methods	5	102	
13	Computer Practice	4	136	
14	Theory of Economic Statistics	5	102	
15	Macro- and Micro- Economics	3	51	
16	Input and Ouput Analysis	3	51	
17	Regression Analysis	3		
18	Multivariate Statistical Analysis	4		
19	Time Series Analysis	3		
20	Methods of Sampling	3		
21	Calculation of Probability Statistics	3		
22	Econometrics	3		
23	Operations Research	3		
24	Differential Equations	4		
25	Stochastic Processes	6		
26	Non-Parametric Statistics	3		
27	Theory of Measurement	3		
28	Fundamental Information Theory	3		
29	Statistics of Stochastic Processes	3		
30	Function and Topology	3		
31	Fourier Analysis	3		
32	Second Foreign Language	4		
33	Basic English	8		
34	English for Statistics	2		
35	Physical Culture	2		

APPENDIX III *Programme of the Discipline of Applied Mathematics for Post-graduate Students, Shanghai University of Finance and Economics*

General Curricula

Semester	Required Courses	Credits	Total
1st Semester	'Capital'	3	
	English	6	
	Western Economics	3	12
2nd Semester	'Capital'	3	
	English	4	
	Western Economics	3	
	Theory of Probability (I)	3	
	Marxist Philosophy	2	15
3rd Semester	Mathematical Statistics	3	
	Stochastic Processes and Time Series	3	
	Computer Programme	2	
	Theory and Design of Sample Surveys	2	10
4th Semester	Data processing and Analysis	2	
	Decision Theory	2	
	Economic Statistics	2	
	Econometrics	3	9
5th Semester	Applied Multivariate Analysis	3	
	Operations Research	3	
	Economic Statistics of Western Countries	2	8
		Total	54

Elective Courses

1. Theory of Probability (II)
2. Stochastic Processes
3. Selected Readings of Statistics
4. Statistical Quality Control
5. Design of Experiments
6. Methods of Prediction
7. Demography
8. Social Statistics
9. China's System of National Accounts
10. Fundamentals of Enterprise Management
11. Principles of Accounting
12. Linear Models

APPENDIX IV

List of main Universities and Institutes that have Departments or Disciplines of Statistics in China

The Chinese People's University
Beijing University
Nankai University
Fudan University
Xiamen University
Jinan University
The China Science and Technology University
Tianjin Institute of Finance and Economics
Xian Statistics Institute
Shanxi Institute of Finance and Economics
Liaoning University of Finance and Economics
Shanghai University of Finance and Economics
Jiangxi Institute of Finance and Economics
Zhongnan University of Finance and Economics
Hunan Institute of Finance and Economics
Sichuan Institute of Finance and Economics
Shaanxi Institute of Finance and Economics
Hebei Geological College
Northwestern Teachers' College
Zhejiang Polytechnical School of Metallurgy and Economics

CHAPTER 11

The Teaching of Statistics in Vietnam

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11.1 BRIEF DESCRIPTION OF THE SRV EDUCATIONAL SYSTEM

The Socialist Republic of Vietnam has an area of 329,566 sq. km. According to the national census of 1 October 1979, Vietnam's population stood at 52,741,000. At present, the total population (1985 estimate) is 57,372,000.

Since 1945, education in Vietnam has made significant steps forward and has gone through many reforms. The last educational reform beginning in 1981 aimed at modernizing the general education program and setting up a national system of schools: the basic (primary) general education schools (8 year) and the secondary general schools (4 years). In the 1981–1982 school-year, the whole country had 313,000 general education classes of all levels with an enrolment of 14 million pupils.

So far, Vietnam has 95 institutions of higher education with 18,720 lecturers and professors and 278 secondary vocational schools with 11,000 teachers.

For a long time, Vietnamese has been the medium of teaching. Many textbooks in Vietnamese have been published.

11.2 EDUCATIONAL AND TRAINING PROGRAMS

In Vietnam, statisticians are trained mainly in the universities and colleges. Currently, many institutions of higher education such as University of Hanoi, University of Ho Chi Minh City, Can tho University, Hanoi Polytechnic, Economics and Planning College, Forestry College, Medical College of Hanoi, Water Conservancy College, etc, offer courses in statistics. Programs vary from one institution to another. Here, we only mention the educational programs of some typical institutions.

The University of Hanoi (established 1956) comprises faculties of mathematics, physics, chemistry, biology, etc.

Presently, in the faculty of mathematics, the basic course in probability and statistics is given in 2 modules:

* Institute of Mathematics.
** Hanoi Polytechnic.
*** University of Hanoi.