

Chapter 10

Education and Training

10

EDUCATION AND TRAINING

I. INTRODUCTION

10.01 Education and skill training is accorded high priority in nation-building in order to provide a sufficient pool of well-educated, highly-skilled and strongly-motivated labour force as well as to produce responsible citizens with high moral and ethical values. Education and training programmes and projects during the Sixth Plan period focused on expanding the capacity of institutions and improving the quality of manpower. In addition, increasing accessibility and participation of the low-income group in education and training were emphasized.

10.02 During the Seventh Plan period, a number of major changes will be introduced to the education and training system with a view to strengthening and improving the system. These efforts are expected to improve the quality and increase the quantity of output to meet the manpower needs of the nation, particularly in the fields of science and technology. In addition, continued emphasis will be given to expand educational opportunities for those in the rural and remote areas.

10.03 Skill training will be undertaken on a larger scale with the objective of increasing enrolment in and output of skilled technical manpower from both the public and private training institutions. Training institutions will conduct more advanced skill courses in line with the changing economic structure of the country as it moves towards high technology and higher value-added activities.

II. PROGRESS, 1991-95

Education Programmes

10.04 During the Sixth Plan period, the overall thrust of education was on expanding capacity and increasing access to all levels of education, strengthening

the delivery system and improving the quality of education. The development of curricular and co-curricular activities emphasized the objective of producing Malaysian citizens who are knowledgeable, innovative and possess positive values, and thus able to participate actively and contribute to the development of the nation. In this regard, the private sector and privatized public entities were also encouraged to expand their capacity and provide quality education.

10.05 The expansion in education programmes resulted in increases in enrolment at all levels of education. However, several concerns still remained, particularly those pertaining to student academic achievement and enrolment in the science stream at the secondary level. In addition, only a small proportion of students of the relevant age-group was enrolled at the degree level in public institutions of higher learning.

Pre-school Education

10.06 Recognizing the importance of pre-school education in laying a strong foundation for children in their formative years, efforts were taken to increase facilities and improve quality of pre-school education. As the private sector was more active in the establishment of pre-school centres in urban areas, the public sector agencies continued to provide pre-school education opportunities to rural and urban poor children. Efforts by both the public and private sectors including non-governmental organizations (NGOs), resulted in an increase in pre-school centres from about 6,960 in 1990 to 10,350 in 1995. Correspondingly, the number of children in the 5-6 age category enrolled in these centres increased from 328,800 in 1990 to 420,600 in 1995, representing an increase of 27.9 per cent. The public sector was the main provider of pre-school centres, totalling 8,450 or 81.6 per cent, while the private sector including NGOs accounted for the balance. Of the total pre-school centres established by the Government, 80 per cent were in rural areas which benefitted about 204,100 rural children.

10.07 Improvements in the quality of pre-school education were carried out through revision of the curriculum guideline, expansion of teacher training and establishment of minimum qualification for pre-school teachers. The revised curriculum emphasized the diversification of teaching methods to make them more interesting to children. These methods included exploring the natural environment, using attractive teaching materials and encouraging teachers to familiarize children with proper usage of *Bahasa Malaysia* as well as simple usage of English words in their daily communication and activities.

Primary Education

10.08 The development of primary education continued to focus on expanding capacity, improving existing facilities, increasing accessibility to better education for all children in the 6-11 age-group including the disabled and improving student achievement, particularly in rural and remote areas. Measures taken to improve the overall quality included increasing the number of experienced and qualified teachers, particularly in rural schools as well as developing and improving teaching and learning materials. In order to instil interest in science from an early age, elements of science were introduced in the Standard I curriculum during the 1994/95 school session, while science as a separate subject was introduced in Standard IV. In addition, to increase competency in mathematics, a more detailed syllabus for teaching mathematics for Standards I and IV was developed in 1994.

10.09 Universal primary education was maintained throughout the Plan period. Primary school enrolment increased by 16.7 per cent from 2.4 million in 1990 to 2.8 million in 1995, as shown in *Table 10-1*. Despite the success achieved in universal education, the number of students who dropped out from the Government and Government-aided schools was quite large. Of the total children in the age cohort 6 – 11 enrolled in these schools, about 4.0 per cent or 18,000 children did not complete primary education. However, a substantial number of these children were enrolled in private primary schools as shown by the increased enrolment in such schools during the Plan period.

10.10 In order to accommodate increases in enrolment, reduce overcrowding in urban schools and replace dilapidated facilities in rural areas, a total of 9,530 additional classrooms was constructed to benefit about 353,000 students. As a result, the classroom-student ratio improved slightly from 1:38.3 in 1990 to 1:36.4 in 1994. However, due to the rapid increase in enrolment, particularly in the urban areas, 28 per cent or 23,363 classes had an enrolment of more than 40 students per class. To reduce the pressure of classroom shortage, the respective schools conducted classes in the afternoon. The number of schools with such classes increased from 15.5 per cent in 1990 to 18.3 per cent of total primary schools in 1994.

10.11 Improvements in education facilities and access of the poor and those in the rural areas to educational opportunities continued to be given priority during the Plan period. Educational facilities in rural areas were expanded and

TABLE 10-1
STUDENT ENROLMENT IN LOCAL PUBLIC INSTITUTIONS,
1990-2000

Level of Education	Enrolment ¹						Increase (%)	
	1990	%	1995	%	2000	%	6MP	7MP
Pre-school	173,570	4.2	256,800	5.2	399,980	7.1	48.0	55.8
Primary²	2,445,600	59.2	2,766,870	56.1	2,922,860	51.5	13.1	5.6
Lower Secondary	943,920	22.8	1,124,910	22.8	1,279,020	22.5	19.2	13.7
Government & Government-aided Schools	942,800		1,122,180		1,264,620		19.0	12.7
MARA Junior Science Colleges	1,120		2,730		14,400		143.8	427.5
Upper Secondary	371,760	9.0	514,970	10.4	693,880	12.3	38.5	34.7
Government & Government-aided Schools	331,050		459,850		592,940		38.9	28.9
MARA Junior Science Colleges	9,770		6,320		11,500		-35.3	82.0
Vocational & Technical Schools	30,940		48,800		89,440		57.7	45.4
Post-Secondary	73,980	1.8	80,080	1.6	95,530	1.7	8.2	19.3
Government & Government-aided Schools	63,250		64,610		70,040		2.2	8.4
Pre-diploma & Pre-university Courses ³	10,730		15,470		25,490		44.2	64.8
Teacher Education (Non-graduates)	21,750	0.5	35,410	0.7	32,000	0.6	62.8	-9.6
Certificate	10,130	0.2	17,080	0.3	21,290	0.4	68.6	24.6
Diploma	32,020	0.8	46,930	1.0	61,900	1.1	46.6	31.9
Degree⁴	58,440	1.4	89,600⁵	1.8	167,900	3.0	53.3	87.4
Total	4,131,170	100.0	4,932,650	100.0	5,674,360	100.0	19.4	15.0

Notes:

¹ Enrolment refers to total student population in that particular year at the particular level of education.

² Includes Government and Government-aided schools.

³ Includes preparatory courses conducted at the Institut Teknologi MARA (ITM) and all universities excluding Universiti Teknologi Malaysia and enrolment of foreign students at the Universiti Islam Antarabangsa (UIA).

⁴ Includes enrolment in post-graduate courses in institutions of higher learning and enrolment in advanced diploma courses at the ITM, Kolej Tunku Abdul Rahman and off-campus courses at the Universiti Sains Malaysia and the ITM. Enrolment of foreign students at the UIA is excluded.

⁵ In 1995, about 50,600 students were enrolled at the degree level overseas and 6,100 students were enrolled at the degree level in local private institutions. Of the total overseas, 39.5 per cent were Government-sponsored students.

improved to provide a more comfortable and conducive learning environment. Efforts were also taken to provide small schools, with enrolment of less than 150 pupils, with better facilities such as new classrooms to replace dilapidated ones, library facilities, teaching and learning materials as well as trained teachers.

10.12 Hostel facilities continued to be provided in rural and remote areas to cater for students who lived far away from their schools, thereby, enabling them to have access to educational opportunities and a better learning environment. In addition, hostels were also built in urban areas to accommodate students from rural areas. With these hostel facilities, rural students were able to gain access to a more conducive learning environment and better learning facilities in urban areas. During the Plan period, hostel facilities were expanded to benefit about 59,330 primary school students. Furthermore, promising students from rural areas were also given opportunities to pursue their secondary education in fully residential schools. These schools provided students with better facilities as well as trained and experienced teachers who provided guidance and supervision.

10.13 Measures aimed at increasing participation of rural children and retaining them in the education system included the provision of financial assistance and textbooks-on-loan as well as health and nutrition programmes. During the period, RM182 million was spent on financial assistance for the poor and RM339.4 million was spent on the textbooks-on-loan programme which benefitted about 0.5 million and 2.6 million children, respectively. Another RM139.4 million was spent on the supplementary food programme for the poor which benefitted about 0.5 million children.

10.14 As an incentive to attract qualified and experienced teachers to serve in the rural and remote areas, more teachers' quarters were provided. During the Sixth Plan period, a total of 5,100 units of teachers' quarters was constructed benefitting about 5,250 teachers. However, the total units of quarters provided was still insufficient to fulfil the overall demand and the teacher-teachers' quarters ratio remained low at 1:0.07 during the Plan period. In addition, frequent transfers of teachers from rural to urban schools still persisted, particularly after teachers had served in rural areas for several years. This had slightly affected the quality of teaching in rural areas.

10.15 In order to provide quality education as well as greater access to education, the responsibility of providing education for the *Orang Asli* children was taken over by the Ministry of Education from the Department of *Orang Asli* in 1995. As a result, these children were provided with trained teachers, better school facilities as well as teaching and learning materials.

10.16 Efforts were also undertaken to provide greater access to education for disabled children and those with learning difficulties. In this regard, a special education programme was implemented in 26 special schools for the disabled and those with learning difficulties. In addition, under the inclusive education programme, children with hearing and sight impairment were enrolled with normal children in 139 schools. At the end of the Plan period, 7,090 disabled children were enrolled in such schools. Eleven new special schools with appropriate teaching and learning facilities for disabled children were under various stages of implementation.

10.17 Despite efforts to improve the overall academic performance of primary school students, gaps in students' achievements between rural and urban schools still remained. The results of the *Ujian Penilaian Sekolah Rendah* (UPSR) showed that the urban schools fared better. In addition, analysis on the level of achievement by subject in the 1995 UPSR showed that only 18.8 per cent of rural students scored excellent grades for the English language, while urban students achieved a relatively higher rate of 41.8 per cent. The attainment of excellent grades in mathematics among rural students was also relatively lower, where only 35.4 per cent of the rural students obtained excellent grades compared with 47.8 per cent for urban students.

10.18 In order to improve the academic performance of students, the Government continued to implement remedial education to improve the overall performance of slow learners and low achievers, particularly in the rural areas. Among the measures taken were the organization of students into separate groups based on their academic performance, the introduction of simpler and more effective teaching methods as well as the utilization of audio-visual aids. During the Plan period, efforts were undertaken to increase the number of remedial teachers by expanding in-service courses which were specifically designed for remedial education. In 1995, there was a total of 1,918 remedial teachers, reflecting a teacher-student ratio of 1:1,442 which was still below the targetted ratio of one remedial teacher for every 500 students.

Secondary Education

10.19 Enrolment at the secondary level in Government and Government-aided schools increased by 23.1 per cent from about 1.3 million in 1990 to about 1.6 million in 1995, as shown in *Table 10-1*. At the lower secondary level, enrolment increased by 19.2 per cent as a result of improvement in the transition

rate from primary to lower secondary from 83 per cent in 1990 to 84.5 per cent in 1995. Likewise, enrolment at the upper secondary level increased by 38.5 per cent as a result of the policy to gradually implement the extension of basic education from nine to 11 years. With the gradual implementation of the policy in the Sixth Plan, the transition rate from lower to upper secondary level improved from 68 per cent in 1990 to 83 per cent in 1995, while the participation rate at the upper secondary level increased from 50.4 per cent in 1990 to 63.7 per cent in 1995.

10.20 Continued emphasis was given to expanding facilities, increasing accessibility and reducing the dropout rate, so as to increase the enrolment ratio in line with the objective of achieving universal secondary education. Priority was also given towards improving the overall quality by increasing the number of the graduate teachers in secondary schools. Efforts were also taken to increase and improve the teaching and learning materials including textbooks.

10.21 During the Sixth Plan period, a total of 5,280 additional classrooms was planned for construction to cater for the increase in enrolment and to reduce overcrowding, particularly in urban schools. However, only 75 per cent or 3,960 classrooms were completed at the end of the Plan period. With the delay in the construction of new classrooms and the increase in enrolment, the class-classroom ratio improved slightly from 1:0.69 in 1990 to 1:0.75 in 1995. To overcome the shortage of classrooms, about half or 721 secondary schools continued to conduct classes in the afternoon. In addition, 14.3 per cent of these classes had more than 40 students per class.

10.22 Despite improvement measures being undertaken, there were still concerns with regard to student achievement and the proportion of students who chose science subjects at the upper secondary level. During the period, the percentage share of students at the upper secondary level in Government and Government-aided schools enrolled in the science and technical streams declined from 22.8 per cent in 1990 to 21.3 per cent in 1995. This enrolment level was still below the 60 per cent target of having upper secondary students enrolled in the science stream.

10.23 The academic performance in the *Sijil Pelajaran Malaysia* (SPM) examination, particularly of rural students, remained a major concern. The overall failure rate at the national level was 33.9 per cent in 1993 and 32.9 per cent in 1995. Of the total failures in 1995, 58.3 per cent were rural students.

Analysis of academic achievement by subject showed that more than half of the rural students failed in English and 38.5 per cent in mathematics. Among the rural students who sat for pure science subjects, 3.5 to 5.1 per cent achieved excellent grades compared with 9 to 12 per cent for urban students.

Technical and Vocational Education

10.24 Continued efforts were taken to expand the supply of skilled manpower through increased intake into the secondary technical and vocational schools. In 1995, there were nine secondary technical schools (STS) and 69 secondary vocational schools (SVS) compared with 58 SVS in 1990. The enrolment in these schools increased from 30,940 in 1990 to about 48,800 in 1995, while the output was 13,500 for STS and 82,700 for SVS. The majority of students from STS continued their studies in various institutions of higher learning, while SVS school leavers were mainly absorbed into the job market. The skill stream at SVS produced a total of 23,500 graduates which contributed to the supply of semi-skilled manpower.

10.25 In view of the need to increase more science and technical manpower, measures were taken to increase the supply of students with strong foundation in mathematics, science and technical-related subjects to enable them to enrol in science and technical courses at the tertiary level. In this regard, 20 SVS were converted into STS for the 1996 school session. With this conversion, the intake into the vocational and skill streams was reduced in these schools.

10.26 In order to provide opportunities for students in secondary schools to study engineering technology and engineering drawing, these subjects were also introduced in selected secondary schools. This move was to familiarize students with technical subjects and to instil an interest in as well as prepare them to continue their studies in various science and technology-related courses at the tertiary level.

Teacher Education

10.27 The teacher education programme was aimed at producing trained teachers for the primary and secondary levels. Emphasis was given to producing quality teachers who were innovative, dedicated, committed and strongly motivated.

In this regard, the teacher training curriculum and co-curricular activities focused on teaching methods and the acquisition of knowledge in various subjects, as well as emphasized the inculcation of positive values and discipline. In addition, beginning in 1994 computer courses were made compulsory to all trainees in teacher training colleges.

10.28 During the Plan period, a total of 48,090 non-graduate teachers was trained by the 31 teacher training colleges, while 22,770 graduate teachers were trained by these colleges and the universities. However, the number of trained teachers was inadequate to fulfil total requirements. In 1995, primary schools experienced a shortage of about 9,780 trained teachers. At the secondary level, the shortage was about 4,600 teachers, mainly in mathematics, English language and science subjects. The shortage was partly overcome through the recruitment of temporary teachers as well as reemployment of 2,930 retired teachers. The shortages and untrained teachers affected quality of teaching and delivery of education. In urban schools where the ratio of students per class was relatively higher than the rural schools, teachers were overburdened and stressed.

10.29 For secondary schools, the emphasis was to produce more graduate teachers so that only graduate teachers teach at the secondary level. Towards this end, a total of 20 teacher training colleges was given the responsibility to conduct the Post-Graduate Teacher Training Programme leading to the award of a Diploma in Education. Another seven colleges offered twinning programmes with local universities to enable serving teachers to obtain degree qualifications. In 1995, 50,670 or 58 per cent of the total secondary school teachers were graduates compared with 36 per cent in 1990. The Master Teacher concept was introduced in 1995, with the aim of acknowledging and rewarding outstanding teachers who had contributed significantly to improve school performance.

10.30 Efforts were taken to strengthen and upgrade knowledge and teaching skills in science and mathematics. In this regard, a total of 280 serving teachers were sent for training at the Regional Centre for Science and Mathematics in Pulau Pinang during the Plan period. To ensure that primary school teachers have a strong foundation in science and mathematics, a teacher training college was also established in 1994 in Bintulu, Sarawak, specifically to produce science and mathematics teachers for primary schools. In addition, trainees in all teacher training colleges were required to have a minimum of five credit passes with a pass in mathematics at the SPM level except those teaching Islamic studies, English and music.

10.31 Measures aimed at enhancing teaching skills of serving teachers were also carried out. During the Plan period, about 45 per cent of teachers at the primary and secondary levels attended in-service courses in various subjects. In addition to the four existing state education resource centres, 350 teacher activity centres were established at the district and school levels to provide facilities for teachers to improve teaching methods and to prepare teaching and learning materials through discussions and workshops.

Tertiary Education

10.32 In order to meet the manpower requirements of a rapidly growing economy, tertiary education in the Sixth Plan period was directed at increasing enrolment at the degree, diploma and certificate levels, particularly in science, medicine, engineering and technical-related courses. Efforts were undertaken to increase intake into local public institutions of higher learning by expanding physical facilities in existing campuses and establishing new universities, namely, the *Universiti Malaysia Sarawak* (UNIMAS) and the *Universiti Malaysia Sabah* (UMS). The permanent campuses of the *Universiti Islam Antarabangsa* (UIA) in Gombak, the teaching hospital of the *Universiti Kebangsaan Malaysia* (UKM) in Cheras and four new polytechnics in Dungun, Johor Bahru, Seberang Prai and Shah Alam were in various stages of implementation.

10.33 *Enrolment* at the degree, diploma and certificate levels increased by 52.7 per cent from 100,590 in 1990 to 153,610 in 1995. Of the total enrolment in 1995, 58.3 per cent were in the degree courses, 30.5 per cent in the diploma and the rest in certificate courses, as shown in *Table 10-1*. At the first degree level, the total enrolment of the combined science and technical streams increased from 41 per cent in 1990 to 45 per cent in 1995, as shown in *Table 10-2*. At the diploma level, a similar enrolment trend occurred, as shown in *Table 10-3*. In addition, opportunities for *Bumiputera* to pursue studies at the tertiary level were expanded at the *Institut Teknologi MARA* (ITM) where enrolment increased from 27,500 in 1990 to 32,480 in 1995.

10.34 With respect to the *output* from public institutions of higher learning, arts graduates exceeded science and technical graduates. During the Plan period, 58 per cent of the first degree graduates were in the arts stream compared with 63 per cent in the Fifth Plan period. Improvements in the enrolment and output of science and technical courses reflected the successful measures taken to increase enrolment in these courses.

TABLE 10-2

**ENROLMENT AND OUTPUT FOR FIRST DEGREE COURSES
FROM LOCAL PUBLIC EDUCATIONAL INSTITUTIONS, 1990-2000**

Course	Enrolment				Increase (%)			Output				
	1990	%	1995 ¹	%	2000	%	6MP	7MP	6MP	%	7MP	%
Arts	31,220	59	43,610	55	70,970	49	28	63	38,270	58	54,090	50
Arts & Humanities ²	17,790		21,600		36,080		21	67	22,160		28,520	
Economics & Business ³	11,320		19,210		31,600		70	64	13,770		22,970	
Law	2,110		2,800		3,290		33	18	2,340		2,600	
Science	14,460	27	22,290	28	42,280	29	54	90	17,370	27	33,980	31
Medicine & Dentistry	2,380		2,580		5,230		8	103	2,900		3,030	
Agriculture & Related Sciences ⁴	1,610		3,260		4,330		102	33	1,430		1,400	
Pure Sciences ⁵	4,610		5,580		8,130		21	46	3,600		7,590	
Others ⁶	5,860		10,870		24,590		85	126	9,440		21,960	
Technical	7,130	14	13,430	17	31,450	22	88	134	9,830	15	20,010	19
Engineering	5,520		10,430		24,750		89	137	6,420		14,110	
Architecture & Town Planning	640		1,750		3,670		173	110	1,200		3,050	
Survey	300		460		1,130		53	146	370		700	
Others ⁷	670		790		1,900		18	141	1,840		2,150	
Total	52,810	100	79,330	100	144,700	100	50	82	65,470	100	108,080	100

Notes:

¹ It was estimated that a total of 50,600 students was enrolled in degree level courses abroad. Of this total, 18,300 were Government-sponsored students enrolled in first degree courses of whom 59.8 per cent were in science and technical courses.

² Includes art and design, Islamic studies, languages, library science, literature, Malay culture and social science.

³ Includes accountancy, agri-business, business management and resource economics.

⁴ Includes home science and human development.

⁵ Refers to biology, chemistry, mathematics and physics.

⁶ Includes applied science, environmental studies, food technology, pharmacy and science with education.

⁷ Includes property management.

TABLE 10-3

**ENROLMENT AND OUTPUT FOR DIPLOMA AND CERTIFICATE
COURSES FROM LOCAL PUBLIC EDUCATIONAL INSTITUTIONS, 1990-2000**

Course	Enrolment			Increase (%)			Output		
	1990	1995	2000	1995	2000	2000	6MP	7MP	%
DIPLOMA									
Arts	17,050	23,330	30,240	53	50	49	18,690	31,590	47
Arts & Humanities ¹	1,590	3,370	7,710				3,770	5,900	
Economics & Business ²	15,460	19,960	22,530				14,920	25,690	
Science	6,190	8,860	8,320	19	19	13	7,060	7,040	11
Agriculture & Related Sciences ³	2,290	1,690	1,490				2,130	1,180	
Others ⁴	3,900	7,170	6,830				4,930	5,860	
Technical	8,780	14,740	23,340	28	31	38	11,620	19,780	35
Engineering	6,010	11,040	17,790				1,440	3,150	
Architecture & Town Planning	1,640	1,940	2,580				750	1,480	
Survey	570	720	1,570				310	590	
Others ⁵	560	1,040	1,400				310	590	
Total	32,020	46,930	61,900	100	100	100	39,870	63,630	100
CERTIFICATE									
Arts	1,750	3,360	5,080	17	20	24	7,760	8,470	26
Arts & Humanities ¹	440	610	1,840				1,300	1,890	
Economics & Business ²	1,310	2,750	3,240				6,460	6,580	
Science	720	1,170	2,500	7	7	12	4,500	8,460	15
Pure Sciences ⁴	40	80	150				2010	350	
Others ⁵	680	1,090	2,350				2,490	8,110	
Technical	7,680	12,550	13,700	76	73	64	17,520	23,990	59
Engineering	6,450	10,880	11,900				15,350	20,220	
Architecture & Town Planning	990	1,200	1,320				1,570	2,830	
Survey	240	470	480				600	940	
Total	10,150	17,080	21,280	100	100	100	29,780	40,920	100

Notes:

- ¹ Includes music, photography, public administration and secretarial studies.
- ² Includes accountancy, banking and hotel management & catering.
- ³ Includes home science and human development.
- ⁴ Includes biology, chemistry, mathematics and physics.
- ⁵ Includes applied sciences, computer studies and environmental studies.
- ⁶ Includes property management.

10.35 The *intake* into the first degree level courses increased from about 11,000 in 1990 to 17,000 in 1995. The limited capacity of public local institutions resulted in only about 50 per cent of applicants being admitted into degree level courses. The number of those in the 19-24 age-group enrolled at the first degree level remained small at about 3.5 per cent in 1995. Although this rate showed a slight improvement from only 2.6 per cent in 1990, the enrolment rate of 3.5 per cent was very much lower than that in the developed countries.

10.36 During the Plan period, a sizeable number of Malaysian students continued their studies abroad. In 1995, an estimated 50,600 Malaysian students or 20 per cent of students in tertiary education were enrolled in various institutions overseas. Of this total, about 20,000 or 39.5 per cent were Government-sponsored students. Among this group, 18,300 were first degree students, of whom, 59.8 per cent pursued science, medicine, engineering and technical-related courses.

Training Programmes

Skill Training

10.37 Skill training programmes were directed at producing adequate supply of skilled workers, particularly to meet the needs of the expanding industrial sector. During the Plan period, public training institutions continued to be the main source of supply of skilled workers. Various measures were taken to increase training capacity through the expansion of existing facilities and the establishment of new institutions. The intake of trainees was also increased through the introduction of double-shift training sessions and the implementation of weekend classes. These measures resulted in an increase in the intake of trainees from 22,220 in 1990 to 43,100 in 1995, as shown in *Table 10-4*. During the Plan period, the output of skilled and semi-skilled manpower from local public training institutions totalled 145,670. Of the total, 92,250 trainees or 63.3 per cent were in the engineering trades and 11 per cent in the building trades.

10.38 To meet the needs for higher skilled manpower in new skill areas at the higher level and to take advantage of advanced technology in developed countries, advanced skill training institutes were established with the cooperation of the Federal Republic of Germany, France and Japan. The German-Malaysian Institute (GMI), established in 1992, offered advanced skill training, particularly in production technology and industrial electronics. The Institute, with a maximum enrolment capacity of 450 trainees, produced its first batch of 57

TABLE 10-4
**INTAKE AND OUTPUT OF SKILLED AND SEMI-SKILLED MANPOWER
 BY COURSE FROM LOCAL PUBLIC TRAINING INSTITUTIONS, 1990-2000**

Course	Intake			Increase (%)			Output		
	1990	1995	2000	6MP	7MP	7MP	6MP	7MP	7MP
Engineering Trades	15,540	28,720	22,960	84.8	-20.1		92,250	114,970	
Mechanical ¹	9,960	15,650	12,140	57.1	-22.4		52,510	59,310	
Electrical ²	5,390	11,890	10,620	120.6	-10.7		38,590	34,480	
Civil ³	190	1,180	200	121.1	-83.1		1,150	1,180	
Building Trades ⁴	2,770	3,800	3,910	37.2	2.9		16,060	19,770	
Printing Trades ⁵	30	160	3,090	433.3	1,831.3		320	11,960	
Commerce	2,290	5,130	7,060	124.0	37.6		15,440	13,500	
Agriculture	420	390	0	-7.1	-100.0		1,870	760	
Others ⁶	1,070	3,310	7,200	209.3	117.5		16,230	34,250	
Skill-upgrading	100	1,590	1,500	1,490.0	-5.7		3,500	4,800	
Total	22,220	43,100	45,720	94.0	6.1		145,670	200,010	

Notes:

- ¹ Includes general mechanics, general machining, tool & die making, motor vehicle mechanics, welding, sheet metals works and fabrication.
- ² Includes electrical installation & maintenance, radio & television servicing, refrigeration & air conditioning, electrical fitting & armature winding and electronic engineering.
- ³ Includes construction.
- ⁴ Includes carpentry & joinery, woodwork machining, bricklaying and plumbing.
- ⁵ Includes hand composing, machine composing, offset printing and bookbinding & letterpress.
- ⁶ Includes surveying, architectural draftsmanship, photography, laboratory science, dispensing optics, computer programming, information processing, heavy plant operation, architecture, quantity surveying, hotel and catering, and home economics.

graduates in 1995. The Malaysia-France Institute, which began operation in October 1995, had a capacity of 600 trainees and offered courses at advanced level in areas such as maintenance of automated mechanical system and machine, electrical equipment installation and welding technology. In addition, the establishment of the Japan-Malaysian Technical Institute (JMTI) was at the planning stage.

10.39 The National Vocational Training Council (NVTC) reviewed existing trade skills standards with the private sector. As a result of this review, the National Occupational Skill Standards (NOSS) was introduced to replace the National Trade Skill Standards (NTSS). By the end of the Plan period, a total of 42 NOSS covering trades from Levels 1 to 3 was completed. A new certification scheme, the *Sijil Kemahiran Malaysia* (SKM), which included the accreditation of prior learning and achievement was introduced by NVTC in 1993. The new system gave recognition to skills acquired through training and job experience. During the period, the certification scheme covered Levels 1, 2 and 3 of the SKM. The development of NOSS and the introduction of the new certification scheme were in line with the objective of producing skilled manpower in accordance with industrial requirement as well as ensuring graduates from training institutions possessed the required competency in the related skill areas.

10.40 Promotional programmes were also conducted by the various training institutions to provide information to the public on training programmes offered, as well as career opportunities and prospects in skill occupations. These promotional activities included video presentations, road shows and exhibitions, organized visits to training institutions, briefing sessions to secondary school students, publications and dissemination of relevant information through the mass media, information centres and selected public places. At the national level, skill competitions were held annually with the objective of promoting creativity among trainees, and exposing the public to the range of skill areas and career prospects available. The 60 per cent increase in the number of applicants for places in MARA skill training institutes during the Plan period was partly attributed to the success of these promotional activities. A similar trend was also experienced by other training institutions.

Management Training

10.41 Training programmes for public sector personnel focused on the upgrading of managerial capability, improving efficiency and increasing productivity of the public service. During the Plan period, the National Institute of Public

Administration (INTAN) which was the main provider of training for public services personnel trained a total of 103,000 personnel. Of the total, 67 per cent were in the administrative and managerial group. In addition, a total of 2,715 Government officials was sent overseas to continue their studies at the post-graduate level in various fields. In line with the Malaysia Incorporated policy, several programmes aimed at promoting closer rapport between the public and private sector personnel were carried out with the cooperation of European and American firms. Selected Government officials were exposed to corporate management in the private sector through training programmes and attachments with foreign firms abroad. During the Sixth Plan period, 67 officers participated in the British Malaysia Industry and Trade Association (BMITA) programme, while 51 benefitted from the European and American modules.

10.42 During the Plan period, in-service training was also conducted by specialized training institutes for public sector officials. In-service courses for about 95,300 education personnel were conducted by the *Institut Aminuddin Baki* (IAB). In addition, in-service courses to upgrade professionalism and improve diplomatic skills among the diplomatic and foreign relations practitioners were conducted at the Institute of Diplomacy and Foreign Relations (IDFR). A total of 4,200 officials, including 255 foreign diplomats from various developing countries, was trained at the IDFR.

10.43 Training for engineering professionals and technicians was carried out by the *Institut Kerja Raya Malaysia* (IKRAM) for a total of 21,850 personnel from the Public Works Department. Training for 159 evaluation personnel of the Evaluation Department was also conducted at the National Evaluation Institute (INSPEN). Other specific training programmes included training for 3,750 Customs and Immigration officials.

Information Technology in Education

10.44 During the Sixth Plan period, a computer literacy programme was launched with the objective of exposing students to basic knowledge in computer literacy. At the primary level, the computer-assisted teaching and learning programme was implemented in 1994 as a pilot project for students in Standards IV, V and VI in 15 schools in the State of Selangor. Computer software for mathematics and the English language were developed, while software for other subjects were in the planning stage. An assessment of the Standard V student performance in mathematics, carried out by the Ministry of Education, indicated that the programme had facilitated students in acquiring competency in mathematics.

10.45 A pilot project in computer literacy for the secondary level was implemented in 60 secondary schools in rural areas. The computer literacy subject which was offered to Forms I and II students in these schools provided basic computer knowledge and application as well as data and word processing. Students in the secondary technical schools were also taught computer application in designing, manufacturing and programming.

10.46 Besides developing computer programmes for learning and teaching purposes, schools were also encouraged to set up computer clubs as part of the co-curricular activities with the cooperation of the Parent-Teacher Associations (PTAs) and the private sector. As part of the computer literacy programme, the usage of computers in teacher training colleges was intensified. Beginning in 1994, computer courses were made compulsory to all trainees in teacher training colleges.

10.47 Measures were also taken to develop a management information system for the Ministry of Education and its related departments. A study is being carried out to develop the Education Management Information System (EMIS) which will result in computer networking within the Ministry of Education and with the various state education departments, teacher training colleges, state education resource centres, teacher activity centres and schools. In addition, similar efforts were undertaken by local universities and training institutions to develop a comprehensive computer network with adequate linkages within campus, between campuses as well as access to international information through the Joint Advanced Research Integrated Networking (JARING) network.

Participation of the Private Sector in Education and Training

10.48 Government efforts in expanding education and training facilities at all levels were supplemented by the private sector. At the primary level, enrolment in private schools increased by 106.4 per cent from 12,140 in 1990 to 25,060 in 1995. The enrolment in private religious schools increased from 4,020 in 1990 to 6,400 in 1995. The enrolment in private religious primary schools constituted 25.5 per cent of the total enrolment of private primary schools. Enrolment in the private secondary schools increased by 47.6 per cent from 110,700 in 1990 to 163,400 in 1995. Of the total enrolment in 1995, enrolment in the private religious schools constituted 42.2 per cent, while enrolment in the Chinese private schools constituted 36.8 per cent.

10.49 The participation of the private sector was more prominent in tertiary education where courses, mainly in applied arts, were offered at the certificate, diploma and degree levels. At the degree level, courses were offered mainly through twinning programmes with foreign institutions. During the Plan period, two medical colleges were established by the private sector to provide degree courses. In addition, public corporations such as *Tenaga Nasional Berhad* (TNB) and *Telekom Malaysia Berhad* (TMB) also conducted courses at the tertiary level focusing on engineering and information technology. The provision of facilities by the private sector for tertiary education resulted in an increase in enrolment from 42,680 in 1990 to 50,840 in 1995. The enrolment in 1995 constituted 25 per cent of total enrolment in tertiary education in local public and private institutions.

10.50 The private sector's role in supplementing Government efforts to expand skill training opportunities was further strengthened through the sector's continuous involvement in expanding and establishing skill training institutions. In 1995, there were 65 private skill training institutions compared with 25 in 1990. The courses offered were in areas such as mechanical, electrical and civil engineering, computer engineering and information technology. The output from private skill training institutions increased significantly from 3,260 in 1990 to 8,300 in 1995.

10.51 The involvement of private companies in skill training was further facilitated through the introduction of time sector privatization arrangement with public skill training institutions. Under this arrangement, various courses such as electro-mechanical, automated manufacturing and industrial electronics, were conducted in the evenings and during weekends for industrial workers. At the end of the Plan period, a total of 3,200 workers was trained in these institutions.

10.52 During the Plan period, several measures were taken to increase private sector participation in training programmes. The Human Resources Development Fund (HRDF), established in 1993, facilitated private companies in carrying out training for their employees. By the end of the Plan period, 639,100 industrial workers were trained in various training institutions, utilizing funds amounting to RM139.7 million. In 1995, the Human Resources Development Act was amended to enable the HRDF to be utilized for the training of employees in services sector activities such as tourism, hotel and catering, and shipping. The Act also enabled companies with less than 50 employees and a paid-up capital of more than RM2.5 million to participate in the HRDF.

10.53 Management training was also carried out by private sector institutions. In this regard, the Malaysian Institute of Management (MIM) trained about 325 administrative personnel from various organizations, while the National Productivity Corporation (NPC) trained a total of 37,400 personnel, of whom 48.5 per cent were supervisors from various private companies.

III. PROSPECTS, 1996-2000

10.54 In the Seventh Plan, the objective of education and skill training programmes will be to produce an adequate number of skilled and quality workforce to meet the manpower requirements of the country as well as to produce citizens who are disciplined and possess high moral values and good work ethics. Measures to be undertaken will include:-

- o increasing the capacity of existing institutions and establishing new ones, particularly in science, engineering and technical fields;*
- o strengthening the delivery system through the provision of qualified and experienced teachers and instructors, as well as greater utilization of modern technologies and computers so as to improve overall quality;*
- o improving accessibility in order to increase participation at all levels through the expansion of physical facilities and the distance learning programme;*
- o improving the management and implementation of education and training programmes through enhancing managerial capability as well as strengthening the monitoring and evaluation system;*
- o expanding tertiary education facilities to produce more professional manpower as well as improving the financial management and operation of tertiary institutions through corporatization and other means;*
- o strengthening research and development (R&D) within the existing institutions of higher learning as well as collaborating with local and foreign R&D institutions;*
- o increasing science and technical manpower, particularly in R&D;*
- o providing appropriate incentives to increase enrolment in the science stream;*

- o improving educational facilities in rural areas so as to reduce dropouts from the school system, while at the same time improving the performance of rural children;*
- o amalgamating small schools with less than 150 pupils in rural and remote areas into new school complexes to optimize the utilization of facilities and providing the students with better educational and hostel facilities;*
- o inculcating positive values and the right attitudes as well as innovativeness, communication and analytical skills among students and trainees;*
- o improving teachers' morale and performances by reviewing their certification schemes and providing incentives, identifying appropriate awards and giving recognition to dedicated teachers as well as improving teachers' welfare;*
- o encouraging reemployment of retired teachers to overcome shortages in critical subjects;*
- o strengthening the use of Bahasa Malaysia as the medium of instruction in all schools and institutions of higher learning, while at the same time increasing competency in the English language; and*
- o encouraging more private sector investment in education and training to complement public sector efforts.*

Education Programmes

10.55 Expansion of physical facilities will be undertaken at all levels of education, mainly to cater for the increase in enrolment and to create a more conducive learning and teaching environment. At the degree level, greater efforts will be taken to increase enrolment, particularly in science and technical courses. The private sector will also play an increasing role in the development of higher education.

10.56 During the Plan period, the Government will accelerate the construction of new schools and teachers' quarters. In this regard, the design of school buildings and standard of finishes will be improved, while the construction of schools in housing estates will be made the responsibility of the developer.

10.57 Various programmes aimed at improving the quality of education will be undertaken. These include reviewing the curriculum content and giving more emphasis to the teaching of science, mathematics and technical-related subjects, and upgrading the training of teachers to enhance their skills and knowledge. Qualities such as tolerance and respect for each other's values as well as the spirit of voluntarism will also be emphasized in the curricular and co-curricular activities. The curriculum for Islamic knowledge at all levels of education will be reviewed so as to give greater emphasis to the inculcation of good ethics and high moral values among Muslim students.

10.58 The Government will progressively implement single session schools in order to have a more structured and organized implementation of curricular and co-curricular activities. The extended contact hours between teachers and students in schools will provide the opportunity for conducting extra lessons in important subjects such as computer education, mathematics and science. In addition, single session schools will allow for more effective implementation of the Islamic curriculum, enhance learning in schools as well as minimize students' involvement in unhealthy activities.

10.59 Measures will be undertaken to inculcate awareness among parents on the importance of balanced education, the need to support the educational development of their children as well as their participation in school activities. Towards this end, the effectiveness of the PTAs will be further strengthened by increasing activities to attract participation of parents, such as seminars related to children's academic and moral development and parenting courses to inculcate skills among parents in dealing with their children's development. In addition, greater collaboration between teachers, parents and the community will be undertaken to assist in finding solutions to specific problems related to academic performance and discipline.

10.60 To increase the effectiveness of the education system and to strengthen the regulatory framework, a new Act called the Education Act, 1996 was enacted. Among others, the Act will strengthen the concept of a national system of education by including all levels and types of education and bringing within its ambit, pre-school, post-secondary and special education. At the primary and secondary levels, public and private educational institutions will be required to use the national curriculum.

10.61 The Education Act, 1996 will introduce a more flexible approach to the duration of primary schooling between five to seven years. In addition, a

study will be undertaken to determine the possibility of lowering the entry age of children into the primary level from age six to five. This will enable students to complete secondary education and pursue tertiary education or enter the labour market at a younger age.

Pre-school Education

10.62 Pre-school education will be further strengthened during the Seventh Plan to ensure participation of at least 65 per cent of children in the 5-6 age-group. A comprehensive policy will be formulated for the development of pre-school education, covering major aspects such as curriculum, physical facilities and teacher training. With this policy, coordination and quality of pre-school education in the public and private sectors will be further improved.

10.63 The private sector, including NGOs, will be encouraged to provide more pre-school facilities, particularly in the urban peripheries and rural areas. Efforts will be undertaken to increase awareness of parents on the importance of pre-school education in their children's development. In this regard, greater parental involvement in their children's education will be encouraged.

Primary Education

10.64 The main focus of primary education in the Seventh Plan period will be to expand school facilities, particularly in rural areas, and to develop a strong foundation in mathematics, science and English as well as good ethics and discipline among school children. In order to ensure that universal primary education is enhanced, additional classrooms will be built to accommodate the expected increase in enrolment from 2.8 million in 1995 to 2.9 million in the year 2000, as shown in *Table 10-1*. The additional 9,140 classrooms will further improve the class-classroom ratio from 1:0.86 in 1995 to 1:0.90 by the year 2000. The improvement in the ratio implies that the percentage of classrooms utilized in the afternoon will be reduced from 14 per cent to 10 per cent during the Plan period. This is in line with the policy to gradually phase out afternoon classes.

10.65 In order to improve the quality of education in rural and remote areas, as well as reduce the dropout rate, the Government will amalgamate small schools with less than 150 pupils and place the students in new school complexes. These complexes will be equipped with better school facilities,

trained and experienced teachers and students' accommodation. Measures will also be undertaken to introduce new school concepts such as emplacing primary students from Standards IV to VI in under-enrolled schools into selected schools which are equipped with boarding facilities and setting up primary and secondary schools in the same compound.

10.66 With regard to the teaching of mathematics, the new mathematics syllabus will be extended to Standards II, III, V and VI and fully implemented by 1997. To improve the overall student performance in mathematics, emphasis will be given to the development of new teaching methods. The new syllabus, which gives more emphasis to practical experience and utilization of various materials in teaching, will facilitate greater understanding of the subject and retain students' interest. In this regard, teaching and learning methods will also be improved so as to enable students to better comprehend the subject. Simultaneously, efforts will also be undertaken to effectively implement the programme of incorporating elements of science in Standard I to Standard III and as a separate subject for Standards IV to VI. Other measures to be taken include improving textbooks and teaching skills as well as expanding remedial education for slow learners and low achievers. In view of the need to improve competency in the English language, a total of 1,500 serving English language teachers will be retrained to upgrade their skills through twinning programmes with a consortium of British institutions of higher learning.

Secondary Education

10.67 Enrolment at the secondary level in Government and Government-aided schools is expected to increase by 25 per cent from about 1.6 million in 1995 to about 2.0 million in the year 2000, as shown in *Table 10-1*. The increase will be more significant at the upper secondary level with the extension of basic education from nine to 11 years. In order to accommodate the increase in enrolment and to reduce overcrowding, as well as to replace dilapidated classrooms, a total of 9,770 new classrooms will be built.

10.68 Efforts will be intensified during the Seventh Plan period to increase the number of students taking science and mathematics. In order to increase students' interest as well as improve their performance in these subjects, teaching methods which are simple, practical and interesting will continue to be used. Appropriate incentives will be provided to science students so as to increase enrolment in the science stream. Counselling and career guidance will

be intensified to encourage students to pursue science and technical electives. In addition, mathematics and science camps, competitions and exhibitions will be organized. A new topic, *Invention*, will be incorporated in the Living Skills subject at the lower secondary level beginning in the 1996 school session, with the objective of producing students who are creative, innovative and inventive. Other aspects include using computer packages in the teaching and learning of mathematics and science. Steps to update the contents of mathematics and science textbooks in order to take into account the latest technological development and increase reading materials in science, will also be undertaken.

10.69 Greater efforts will be taken to improve the overall academic performance of secondary school students. Priority will be given to improve student competency in *Bahasa Malaysia*, while continued efforts will be made to improve the teaching of English as a second language as well as students' analytical ability. The use of computers in secondary schools will be extensively promoted to build a strong foundation for a computer literate society.

10.70 With the full implementation of 11 years basic education, there will be continuous progression of students from Standard I to Form V. In this regard, extensive monitoring and evaluation of students' performance at all levels will be undertaken, including greater use of the Criterion Reference Test, which will further develop new teaching and learning approaches, as well as enhance students' academic performance, particularly in the early years of schooling. This will enable early detection of slow learners and low achievers and remedial measures be implemented to improve their performance. These measures will also motivate students to strive for excellence and contribute towards increasing the success rates at various levels.

Secondary Technical Education

10.71 Secondary technical education is aimed at producing an adequate pool of qualified students who excel in mathematics and science as well as in basic engineering subjects. These students are expected to continue their studies in the science and technology-related courses at the diploma and degree levels as well as in advanced skills.

10.72 With the critical shortage of engineers and skilled workers, the Government will launch a massive effort to convert all the 69 SVS to STS. The conversion of the 69 SVS will be completed when the ministeries designated with the responsibilities for vocational training have developed adequate capacities

to take over fully this function from the Ministry of Education. By the year 2000, all STSs are expected to have a total enrolment of 89,440 students. In addition to the STS, engineering subjects will also be introduced in 15 fully residential schools and in selected secondary schools, benefitting a total of 7,000 students by the year 2000.

Teacher Education

10.73 During the Plan period, the main objective of teacher education will be to increase the supply of qualified teachers at the primary and secondary levels, particularly in mathematics, science and English language. The curriculum and co-curricular activities for teacher education will further emphasize the development of quality teachers who are not only knowledgeable and innovative, but highly-disciplined, strongly-motivated and dedicated.

10.74 Measures will be undertaken to improve teacher quality as well as to introduce appropriate incentives and facilities to enhance teachers' morale and to make the teaching profession more attractive. The measures include reviewing the remuneration and promotional schemes, determining appropriate allowances and facilities for teachers teaching critical subjects and those teaching in remote areas, and identifying appropriate awards to dedicated teachers. Opportunities for teachers to pursue studies at the diploma and degree levels will also be expanded. In this regard, headmasters of primary schools will have the opportunity of pursuing diploma level courses, while principals of secondary schools will have the opportunity of pursuing post-graduate courses. The level of teacher training for primary school teachers will also be upgraded from certificate to diploma level.

10.75 Several programmes will be implemented to increase the supply of trained teachers which include the construction of four new teacher training colleges, increasing intake into existing colleges and institutions of higher learning and expanding the Post-Graduate Teacher Training Programme. In order to increase the supply of graduate teachers at the secondary level, serving non-graduate teachers will be given the opportunity to continue their studies at the degree level. By the end of the Plan period, a total of 99,900 graduate and non-graduate teachers will be produced, thereby, alleviating existing shortages as well as fulfilling additional teacher requirements. Of the total, 62,050 teachers will be for primary schools, while the balance of 37,850 will be graduate teachers for secondary schools. The additional graduate teachers will increase the proportion of graduate teachers teaching at the secondary level from 58 per cent in 1995 to about 73.5 per cent in the year 2000.

10.76 Efforts to expedite the supply of experienced teachers and to overcome shortages in critical subjects will also be carried out through the reemployment of retired teachers. Towards this end, the Government will determine new terms and conditions of service for this group of teachers.

10.77 Steps will also be taken to continuously upgrade the knowledge of teachers and improve their teaching skills through the strengthening of in-service training programmes and enhancing the capabilities of teacher trainers. In addition, more opportunities will be given to teachers to develop their skills in school management. In this regard, more school management courses will be conducted at the IAB.

10.78 During the Plan period, provision of housing for teachers will be given priority, particularly in the rural and remote areas, in order to attract and retain qualified and experienced teachers in these areas. Teachers' quarters will also be built in selected urban areas where rental is high. In this regard, a total of 80,000 teachers' quarters is being planned to meet the demand for teachers' quarters.

Tertiary Education

10.79 The demand for an educated and skilled workforce will increase in tandem with the country's rapid industrialization. In view of this, the development of tertiary education during the Seventh Plan period will aim at the following:-

- o Increasing capacity to meet the growing local demand for higher education as well as developing higher education as an export industry;*
- o Improving quality and relevance of courses offered so as to match national manpower requirements;*
- o Increasing the enrolment at the first degree level in local public institutions for those in the 19-24 age-group from 3.5 per cent in 1995 to 5.6 per cent in the year 2000;*
- o Increasing the capacity of enrolment in the science, engineering and technical-related courses so as to intensify the production of manpower with science and technical knowledge;*
- o Increasing the capacity for post-graduate courses from 11.5 per cent of total enrolment at the degree level in 1995 to at least 14 per cent in the year 2000;*

- o *Increasing the capacity and capability to undertake research and development (R&D), particularly those which are relevant to industrial and services sectors' requirements; and*
- o *Increasing private sector participation to supplement Government efforts in expanding tertiary education opportunities, while at the same time helping to reduce the growing public expenditure on education.*

10.80 During the Plan period, the overall *enrolment* of full time students in public institutions of higher learning is expected to increase by 63.5 per cent, from about 153,600 in 1995 to 251,100 in the year 2000, as shown in *Table 10-1*. The distribution is expected to be 66.9 per cent for the degree level, 24.7 per cent for the diploma level and the rest for the certificate level. In this regard, the total enrolment in science and technical courses in institutions of higher learning will increase from 76,300 in 1995 to 132,050 by the year 2000. However, within the arts stream, the enrolment in applied arts courses will be adequate to meet manpower requirement for the services sector.

10.81 The *output* at the first degree level is expected to reach an equal proportion between arts and science and technical students. About 56.4 per cent of the science and technical graduates at the first degree level will be produced by *Universiti Pertanian Malaysia (UPM)*, *Universiti Teknologi Malaysia (UTM)* and *Universiti Sains Malaysia (USM)*, each having an output of 11,310, 10,120 and 9,010, respectively, as shown in *Table 10-5*. By the year 2000, it is expected that the combined total output of science and technical graduates both at the diploma and degree levels will be equal to that of arts graduates, as shown in *Tables 10-2 and 10-3*. This balance will be an improvement compared with the predominance of arts graduates in previous Plan periods. This new output trend is consistent with the policy to increase science and technical graduates.

10.82 The increase in enrolment will be accommodated through the expansion of existing institutions as well as the completion of new campuses, namely, the UA in Gombak, the medical faculty of the UIA in Kuantan, UNIMAS in Samarahan and the UMS in Likas. Other new institutions include the ITM branch campuses in Machang, Merbok and Seberang Jaya, four new polytechnics in Dungun, Johor Bahru, Pulau Pinang and Shah Alam and the branch campuses of the *Kolej Tunku Abdul Rahman* in Pulau Pinang and Segamat. At the same time, facilities in existing institutions of higher learning will be expanded to

TABLE 10-5
**OUTPUT FOR FIRST DEGREE COURSES FROM
 LOCAL PUBLIC EDUCATIONAL INSTITUTIONS, 1996-2000**

Course	Output											Total
	UM	UKM	USM	UPM	UTM	UIA	UUM	UNIMAS	UMS	ITM	KJAR	
Arts	8,960	9,370	9,560	3,660	210	4,050	10,060	480	310	4,540	2,890	54,090
Arts & Humanities ¹	6,410	5,900	8,740	2,730	90	750	1,620	480	170	1,630	0	28,520
Economics & Business ²	2,020	3,160	820	830	120	2,150	8,320	0	140	2,520	2,890	22,970
Law	530	310	0	100	0	1,150	120	0	0	390	0	2,600
Science	4,490	3,890	6,170	9,130	3,640	1,210	1,410	810	230	800	2,200	33,980
Medicine & Dentistry	1,140	850	710	250	0	0	0	80	0	0	0	3,030
Agriculture & Related Sciences ³	0	0	0	1,160	0	0	0	210	30	0	0	1,400
Pure Sciences ⁴	0	2,310	0	2,820	0	0	0	0	80	180	2,200	7,590
Others ⁵	3,350	730	5,460	4,900	3,640	1,210	1,410	520	120	620	0	21,960
Technical	1,190	720	2,840	2,180	6,480	1,000	0	140	0	3,320	2,140	20,010
Engineering	1,190	720	2,120	1,880	3,960	700	0	140	0	1,760	1,640	14,110
Architecture & Town Planning	0	0	720	300	650	300	0	0	0	580	500	3,050
Survey	0	0	0	0	300	0	0	0	0	400	0	700
Others ⁶	0	0	0	0	1,570	0	0	0	0	580	0	2,150
Total	14,640	13,980	18,570	14,970	10,330	6,260	11,470	1,430	540	8,660	7,230	108,080

Notes:

¹ Includes Islamic studies, languages, literature, Malay culture, library science, social science, and art and design.

² Includes accountancy, business management, resource economics and agri-business.

³ Includes home science and human development.

⁴ Includes biology, chemistry, physics and mathematics.

⁵ Includes pharmacy, applied science, environmental studies, food technology and science with education.

⁶ Includes property management.

provide more places in the science, engineering and technology-related courses as well as in business, finance, accounting and information technology. By the year 2000, it is targetted that all universities, with the exception of UMS and UNIMAS, will each have 20,000 full-time students.

10.83 The participation of *Bumiputera* in tertiary education will be further increased through the expansion in capacity and the introduction of new courses at ITM. The enrolment at ITM is expected to increase from 32,480 students in 1995 to 52,500 students in the year 2000, with the major focus in science and technical-related courses as well as courses related to the services sector. The ITM will also intensify the implementation of twinning programmes with local and foreign institutions of higher learning to offer degree level courses. The post-graduate programme at ITM will give more emphasis to professional development and skills besides academic achievement.

10.84 During the Seventh Plan period, the *distance learning* programme, which is already in place on a modest scale in ITM, USM and UKM, will be further expanded and will also be implemented in other universities. The main objective of the programme is to provide more opportunities for those in the 19-24 age-group and those who are currently employed, to pursue tertiary level courses, particularly at the degree level. The programme will also include short courses aimed at upgrading the knowledge and skills of the workforce, particularly those at the managerial and supervisory levels. The programme will be better structured, more organized and carried out on a larger scale through closer cooperation between universities and the private sector. New areas of study, particularly in science, technology and management, will be introduced. Efforts will be taken to strengthen the programme and the implementing mechanism to enable it to be launched expeditiously. In implementing the programme, institutions of higher learning will coordinate efforts, share resources and facilities, and take advantage of the communication technology infrastructure that will be in place. In this regard, existing educational and training institutions nationwide will be selected and utilized as distance learning centres.

10.85 With the planned expansion of intake and enrolment in local public and private institutions, less Malaysian students will be sent overseas to pursue courses at the first degree level. Government-sponsored students at the post-graduate level will continue to be sent to universities overseas to pursue selected courses in the fields of science and technology, medicine and applied arts. The reduced dependence on foreign education and the expected increase in foreign students pursuing degree level courses in the country, will help to reduce the deficit in the balance of payments.

10.86 In order to increase R&D activities and to meet the increasing demand for higher qualified teaching staff, the capacity and enrolment for post-graduate and post-doctoral courses, particularly in the fields of science and technology, will be expanded. Enrolment at post-graduate level in local public institutions of higher learning is expected to increase from 11.5 per cent of total enrolment at the degree level in 1995 to at least 14 per cent in the year 2000. Of the total post-graduate students, 41.5 per cent will be in science and technology courses.

10.87 In order to produce appropriate and adequate supply of professionals, particularly in high-technology industrial and services sectors, public institutions of higher learning will introduce new courses and review existing courses in line with current and future requirements. New courses at first degree level will include marine engineering and industrial micro-biology, while at the post-graduate level, bio-mechanical engineering and manufacturing technology engineering as well as new medical courses such as bio-medicine, geriatric medicine and paediatric cardiology will be introduced. As part of the efforts to ensure graduates possess not only the required knowledge and skills but also high moral values, the curriculum and co-curricular activities will emphasize further the development of self-confidence and other positive values such as discipline and resilience.

10.88 With regard to the objective of promoting local institutions of higher learning as *centres of excellence* in R&D and consultancy services, efforts will be undertaken to strengthen R&D activities in areas such as information technology, microelectronics, advanced materials technology, advanced manufacturing, biotechnology, aerospace, energy and environmental-related technology, and communication technology. Institutions will identify specific areas of excellence which will become their focus of R&D and consultancy services in the next five years. Measures will also be undertaken to strengthen the implementation machinery for R&D and consultancy services as well as for the sharing of expertise and resources between faculties, universities and the private sector. During the Seventh Plan period, emphasis will also be given to promote greater cooperation between the Government and professional bodies, so as to ensure that all R&D activities as well as courses offered in the public institutions are recognized by and relevant to the needs of the private sector.

10.89 Public institutions of higher learning will take advantage of the existing *information technology (IT) infrastructure* by expanding usage in various IT-related areas. This will be carried out through more intensive use

of computers and other electronic means in teaching and learning processes. In addition, all public institutions of higher learning will establish electronic libraries to facilitate teaching staff and students to gain quick access to learning and reference materials. Electronic library facilities will be linked with research institutions and institutions of higher learning overseas through the JARING network.

10.90 A *reformation* in the higher education system will be undertaken to cope with the nation's changing demands and expectations. The reformation will emphasize institutional restructuring and formulation of regulatory measures to enable greater private sector participation. The reformation will also put in place the mechanism for improving coordination and ensuring the quality of education offered by the private sector.

10.91 As part of the reformation process, the University and University Colleges Act, 1971, which was amended in 1995, will enable public institutions of higher learning to be corporatized. The corporatization will provide them with greater autonomy to manage and operate their institutions in a more dynamic and proactive manner, as well as being responsive to changing needs and requirements. With this autonomy, institutions of higher learning will have greater flexibility in seeking their own revenue sources, increased capacity for consultancy services and commercialization of research findings as well as recruitment and remuneration of teaching staff.

10.92 The full implementation of the corporatization exercise is expected to gradually resolve the current problem of outflow of experts and experienced lecturers from public institutions of higher learning. These institutions, however, will still be guided by overall Government policy direction and objectives. The Government will ensure that these institutions will continue to be accessible to the low-income group and the disadvantaged by providing appropriate financial assistance.

10.93 The newly established Higher Education Council with members from both the public and private sectors will ensure greater coordination in planning and development of tertiary education during the Seventh Plan period. The Council will provide policy directions as well as plan and coordinate the development of all public and private institutions of higher learning. In addition, the Department of Higher Education, established in 1995, will be strengthened with relevant expertise to provide the necessary support to the Council.

10.94 In line with the national policy, the Government will expand and improve the use of *Bahasa Malaysia* as the medium of instruction. However, while emphasizing the use of *Bahasa Malaysia*, competency in other languages will also be encouraged, particularly the English language which is recognized as an international and commercial language. The establishment of private sector institutions of higher learning and the promotion of education as an export industry will further promote the use of the English language, particularly in private institutions. However, this development will not jeopardize the status and importance of *Bahasa Malaysia* as the national language. Malaysian students enrolled in private sector institutions will be required to study *Bahasa Malaysia*, while foreign students will also be encouraged to learn the language.

Training Programmes

Skill Training

10.95 During the Seventh Plan period, priority will be given to increasing the capacity for skill training, particularly in engineering and technical courses. In addition, efforts will be directed at improving the quality of training and introducing training in new skill areas as well as expanding advanced level courses. In this regard, the capacity of existing institutions will be expanded and facilities upgraded. New training institutions will be established to provide courses in new skill areas as well as advanced level courses. The private sector will be encouraged to establish more training institutions and to provide skill training for their workers.

10.96 In line with the objective to increase the capacity for training in new areas as well as in higher level skills, existing training institutions will be expanded to provide such courses. During the Plan period, nine new skill training institutes offering advanced level courses will be established, some with the cooperation of multi-national corporations. The new institutions include two advanced skill training centres in Johor Bahru and Klang, the JMTI in Pulau Pinang and the Japanese (Nippon) Malaysia Institute in Kulim. The courses offered will include new skill areas such as electronics, telecommunications and information technology, production technology, manufacturing of aircraft components, applied chemistry and instrumentation, and ship-building services and overhauling.

10.97 With the conversion of SVS to STS, the total intake into skill training institutions will increase marginally, by 6.1 per cent, as shown in *Table 10-4*. In order to provide opportunities for basic training for school dropouts and low

achievers, an allocation of RM409 million will be provided to establish an additional 72 *Pusat Giat* MARA, six national youth skill institutes and five industrial training institutes. By the end of the Plan period, a total of 200,000 skilled workers is expected to be produced by all public skill training institutions, as shown in *Table 10-4*.

10.98 Skill training through sponsorship programmes will be further strengthened. Towards this end, collaborative efforts between public training institutions and major privatized entities such as TNB and TMB will be encouraged. Local institutions of higher learning which offer technical courses such as UTM, ITM and KTAR will also be encouraged to develop collaborative efforts with public skill training institutions in conducting skill training programmes.

10.99 Efforts to promote technical skills will continue to be taken, in order to increase public awareness in skill training and attract school leavers to participate in skill training programmes. Appropriate promotional programmes such as public campaigns, advertisement, road shows and exhibitions will be organized on a larger scale to draw potential candidates, including those who perform well in the SPM examination. In this regard, a new *apprenticeship programme* will be developed to enable school leavers at the SPM level to be attached to industry while waiting for their SPM results. This short familiarization programme will benefit both trainees and employers as suitable candidates could be offered employment and further training.

10.100 In line with greater demand for higher level skills, urgent steps will be undertaken by NVTC to develop the NOSS for Levels 4 and 5. The curriculum for skill training will be revised by giving priority to high technology-related subjects, to commensurate with the demand in promoted industries such as machinery and engineering, aviation and aerospace, electronics and information technology.

10.101 Efforts will also be undertaken to increase the number of instructors in public training institutions. Although there was slight improvement in the remuneration scheme for instructors, it was still inadequate to attract and retain qualified and experienced instructors. Towards this end, a review will be undertaken to further improve the terms and conditions of service for instructors, including those on contract, so as to overcome the shortage in existing institutions as well as in newly established ones. A national instructor training programme will be implemented in the Centre for Instructor and Advance Skill Training to produce 200 instructors with higher level skills annually. Efforts will be undertaken by the respective ministries and training institutions to increase the recruitment of foreign instructors on a contract basis.

Management Training

10.102 Improvements in the quality and productivity of the public service is part of the Government's administrative reforms which will be emphasized during the Plan period. Towards this end, INTAN will further expand the training programmes for public sector personnel by conducting management courses in priority areas, appropriate to the current and future needs of the sector. These courses include Total Quality Management (TQM) and the ISO 9000 series of standards, advanced management programme for top management personnel, technology management, financial management as well as related computer courses. During the Plan period, INTAN will train about 150,000 public sector personnel. In addition, INTAN will upgrade existing computer courses to increase computer literacy among public sector personnel at all levels. To realize this, INTAN will upgrade its computer facilities as well as establish linkages with other training institutions.

10.103 Management skills in specific fields for public sector personnel will be intensified in the Seventh Plan. Management skills and knowledge of education personnel will be further enhanced through courses conducted by the IAB. In this regard, the IAB will intensify twinning programmes with local and foreign universities for management courses at the post-graduate level. These twinning programmes will concentrate on developing expertise in education management and proficiency in English.

10.104 Training for other public sector personnel, such as those involved in diplomatic relations, professional and technical fields, evaluation, customs and immigration, will continue to be provided by the respective training institutes. During the Plan period, a total of 7,200 diplomatic and foreign relations practitioners will be trained by the IDFR, 24,000 professionals and technical personnel will be trained by the IKRAM, while training for the Immigration and Customs personnel will involve 5,680 officials and staff. In addition, the range of training for evaluation personnel in INSPEN will be strengthened through the introduction of new courses such as information technology, property management and corporate management. Training for about 5,000 public sector personnel in the judicial and legal services will be carried out at the *Institut Latihan Kehakiman dan Perundangan* (ILKAP). With regard to training for public sector personnel involved in the administration and management of Islamic affairs, the *Institut Latihan Islam Malaysia* (ILIM) will be established during Plan period.

Information Technology in Education and Training

10.105 Computer literacy and computer-assisted teaching and learning programmes will be extended to all schools and training institutions during the next five years. The utilization of computers in educational and training institutions will enhance the teaching and learning processes and help overcome the problems of shortage of trained teachers and instructors in various subjects including languages. In this regard, efforts will be taken to acquire and develop the necessary software. The expansion of distance learning programme and the implementation of electronic libraries in institutions of higher learning will further enhance the usage of computers at the higher education level. The mode of delivery in the distance learning programme will be expanded through teleconferencing and electronic mail.

Participation of the Private Sector in Education and Training

10.106 The private sector is expected to play a more active role at all levels of education with the major expansion expected in higher education. In this regard, the Government will encourage the private sector to focus their efforts on the provision of science and technology-related courses. The implementation of the Private Higher Educational Institution Act, 1996 will enable the private sector to establish degree-granting institutions. It will also enable foreign universities to set up branch campuses in the country. This will further increase enrolment and output at the degree and diploma levels.

10.107 In order to supplement the efforts of the Government, public corporations and large privatized entities will be encouraged to expand their existing training facilities and establish new institutions of higher learning. In this regard, public corporations including *Petroleum Nasional Berhad* (PETRONAS), TNB and TMB are expected to increase the capacity of science and engineering-related courses at the degree level in their training institutions. The combined efforts of public and private training institutions in providing degree level courses will increase the participation rate of those in the 19-24 age-group to about 6.7 per cent in the year 2000, compared with 4.2 per cent in 1995.

10.108 With the expected increase in the number of private sector institutions offering tertiary education, there is a need to ensure that facilities and teaching are of high quality. Towards this end, a National Accreditation Board will be established to provide guidelines and standards for quality control.

10.109 The role of the private sector in providing skill training opportunities is also expected to increase substantially. The high cost of overseas training and the expanding market demand for skilled workers will encourage the private sector to establish training institutions and expand training programmes. The private sector companies are also expected to enhance their training activities through greater utilization of the HRDF and participation in skill development centres established by state governments. In addition, trade and industry associations will be encouraged to undertake industry-related skill training.

10.110 Private management training institutions, particularly the MIM, will intensify its efforts in conducting management courses. Towards this end, the Institute will expand courses at the diploma and degree levels through twinning programmes with foreign institutions of higher learning. In addition, the NPC will also provide more training opportunities for the managerial and supervisory category. During the Plan period, NPC is expected to train about 50,000 personnel, mostly from the private sector.

IV. ALLOCATION

10.111 The development allocation and expenditure for education and training during the Sixth Plan and the allocation for the Seventh Plan period are shown in *Table 10-6*. The allocation for education and training in the Seventh Plan amounts to RM10.1 billion or 15.4 per cent of the total public development allocation compared with 13 per cent in the Sixth Plan. Of the total allocation for the education sector, 45.6 per cent will be utilized to build new schools and additional classrooms for primary and secondary levels and another 35.1 per cent to expand the capacity for tertiary education, particularly at the degree level. The balance will be utilized to provide, among others, training facilities and housing for teachers as well as hostels for primary and secondary school students. Under the allocation for training programmes, RM1.3 billion or 78.4 per cent will be provided to establish new skill training institutes as well as upgrade and expand existing ones. The allocation for skill training which is double that of the previous Plan, is in line with the national training strategy to increase the output of skilled manpower, particularly at the advanced level and in new skill areas.

TABLE 10-6
DEVELOPMENT ALLOCATION FOR EDUCATION AND TRAINING, 1991-2000
 (RM million)

<i>Programme</i>	<i>6MP</i>		<i>7MP</i>
	<i>Allocation</i>	<i>Expenditure</i>	<i>Allocation</i>
Education	7,409.8	6,982.1	8,437.2
Pre-school	61.8	58.0	107.4
Primary Education	1,184.7	1,127.1	1,396.0
Secondary Education	2,050.7	1,909.0	2,447.9
Government & Government-aided Schools	1,603.0	1,475.4	1,781.9
MARA Junior Science Colleges	28.7	28.7	367.0
Technical & Vocational Schools	419.0	404.9	299.0
Tertiary Education	3,139.3	3,039.4	2,961.8
Teacher Education	180.1	155.6	458.8
Other Educational Support Programmes	793.2	693.0	1,065.3
Training	615.4	581.0	1,661.6
Industrial Training	387.4	370.0	1,303.3
Commercial Training	14.0	14.0	66.3
Management Training	214.0	197.0	292.0
Total	8,025.2	7,563.1	10,098.8

V. CONCLUSION

10.112 During the Sixth Plan period, education and skill training programmes were expanded and further improved. These programmes contributed to growth and productivity, particularly in the industrial and services sectors. Aside from public sector programmes, there was greater private sector involvement in producing skilled workers to meet market demand. The Seventh Plan will continue to give priority to further expand facilities, increase accessibility and improve quality. The education and training programmes are expected to produce not only manpower who are knowledgeable, highly-skilled and computer literate, but also imbued with discipline, high moral values and good work ethics. In all these endeavours, the private sector will be an active partner in complementing the efforts undertaken by the Government.

