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ABSTRACT

Prior to 1960 vocational and technical education in Singapore received little attention. After Singapore attained self-government in 1959, a policy of diversification to accelerate economic growth through industrialization was adopted. The emphasis then shifted to technical education and training. In 1964 there was a significant move towards the establishment of secondary vocational schools and the first vocational institute was initiated; the secondary vocational schools were later phased out in favor of vocational institutes. The Industrial Training Board (ITB) was created in 1973 to centralize, coordinate, and intensify industrial training. The ITB and the Adult Education Board established in 1960 were merged into a single national authority responsible for vocational training--the Vocational and Industrial Training Board. The significant factors that have impinged upon the trend of vocational training have been the limited human resources, the New Education System of 1980, and the strategy of high economic growth based on industrial restructuring. Recent developments and major efforts to consolidate the training system have been the expansion of training capacity, refinement of the training system, and upgrading of the existing work force. Four tables and four figures are appended that depict full- and part-time enrollment, apprentice registration, and organizational structures in the educational system. (YLB)

TREND OF VOCATIONAL TRAINING IN SINGAPORE

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Vocational & Industrial Training Board

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ABSTRACT

This paper provides an insight into the evolution of the system of vocational training in Singapore and its present features. The main mission of meeting the needs of projected skilled manpower for economic and industrial development remains the same although underlying changes in the approaches, rationale, methods and targets have been necessary in response to the rapidly changing needs of industries. In the case of Singapore, the key significant factors which have impinged upon the trend of vocational training are identified as the limited human resource, New Education System of 1980 and strategy of high economic growth based on industry restructuring. Recent developments and major efforts to further refine and consolidate the training system are described.

INTRODUCTION

Many countries, developed and developing, have no doubt recognized the crucial role of an effective system of vocational training in order to meet its manpower needs as part of its overall plan for social and economic development. This is certainly true of Singapore where the development of its only and limited human resource through education and training has received the highest priority.

The overall mission of maximizing the available human potential for personal, societal and national interests is a common one. The training systems when fully developed would also share more commonality than basic differences and are likely to depend on the developmental stages of the systems themselves. Vocational training systems are also dynamic and are expected to have the flexibility of responding to the changing manpower needs. As such, there will be changes in the approaches, rationale, methods and targets which are adopted within the broad economic framework and directions.

The objective of this paper shall therefore focus on the more significant changes which have been introduced in the evolution of the system of vocational training in Singapore. To do so, a brief history of earlier interests in technical education, the formalization of the system of vocational training as it is known today, recent developments and our plans for the future are discussed.

BRIEF HISTORY

Beginnings - Prior To 1960

Although the first Government Trade School was established in 1929 and several other vocational schools were opened by missionary and private organizations at later dates, there was very little attention paid to vocational and technical education prior to 1960. There was no real necessity then as it was sufficient for Singapore to depend mainly on entreport trade as the mainstay of her economy. Three developments, however, are worthy of note. The first was the formation of the Singapore Council of Adult Education in 1950 which later led to the establishment of the Adult Education Board (AEB) in 1960. The principal activities of the AEB were to provide opportunities on language education, academic education and further education for those out-of-school on a part-time basis.

The second major development was the Dobby Report (1) in 1953 which recommended the establishment of the Singapore Polytechnic. The Report also highlighted the need for technical education in schools and resulted in the opening of the first two technical secondary schools in 1958. The third was the establishment in 1956 of the Joint Advisory Council for Apprenticeship Training which formulated Apprenticeship Training Schemes in conjunction with the Ministry of Labour.

Build – Up In The 1960s

When Singapore attained self-government in 1959, it became apparent that the commercial and service sectors alone could not expand sufficiently to provide sufficient

jobs for the growing number of school leavers. A policy of diversification to accelerate economic growth through industrialization was adopted. The emphasis was thence shifted to technical education and training.

A significant move towards the establishment of secondary vocational schools and the first vocational institute (the Singapore Vocational Institute) in 1964 was initiated by the Commission of Inquiry into Vocational and Technical Education (2) whose report was released in 1961.

These two-year secondary vocational schools were meant for primary school leavers who failed to qualify for the more esteemed academic or technical streams leading to the General Certificate of Education (GCE 'O') Examination. Students who completed secondary vocational education would receive craft training at the vocational institute.

With the increasing pace of industrialization, there was growing concern on how best to expeditiously expand the vocational training facilities so as to meet the manpower requirements of the emerging industries. This task was undertaken by the National Industrial Training Council in 1968. As a result, a Technical Education Department (TED) was set up within the Ministry of Education to oversee the development of technical secondary education, industrial training and technical teacher training. The secondary vocational schools were phased out in favour of vocational institutes. The apprenticeship schemes were transferred from the Ministry of Labour to the TED in 1969. By 1972, there were nine vocational institutes and the number of graduates increased ten-fold from 324 in 1968 to over 4,000.

Formalization Of Vocational Training System 1973

By 1973, the TED had developed a training infrastructure of sufficient strength for the next major stage of development. It was realised that a separate authority would be required and in a better position to respond to the needs of the rapidly changing industrial scene. Thus, was created, the Industrial Training Board (ITB) in 1973 to centralize, coordinate and intensify industrial training. The system of vocational training was formalized. A tripartite representation was proposed so as to enable the full

participation of industry and labour while safeguarding national interests in industrial training. It was also envisaged that the Board would have more flexibility in an area where slowness to respond to challenging conditions can result in high training wastage on the one hand and critical skill shortages on the other.

Moving along with developments in industrial training, the AEB was undergoing rapid changes in the character of its operations. As educational opportunities for those of school-going age increased, the need for its language and academic education diminished. The growth of community centres also reduced the demand for its recreational and cultural programmes. As such, its activities began to concentrate more and more on vocation-oriented programmes. It started to offer pre-vocational classes for primary school leavers and training in office skills, sewing and hairdressing.

It soon became apparent that the domains of the AEB and ITB were inseparable components of a system for the training of school leavers and upgrading the occupational skills and productivity of adult workers. It was therefore decided that the two Statutory Boards should be merged to rationalize their functions and resources for greater effectiveness. The present day Vocational & Industrial Training Board (VITB) was therefore established as the single national authority responsible for the promotion, development and provision of vocational training for the industrial, commercial and service sectors. Its corporate objective is to provide vocational and industrial training and related continuing education and training (CET) at all appropriate levels and in appropriate forms so that the skilled manpower requirements of Singapore can be met as far as possible by Singaporeans trained to the highest level of competence.

Consolidation Over The Last Ten Years

The 1950s and 70s may be viewed as the first phase of laying a basic structure for vocational training in Singapore. Many approaches and programmes were experimented with and some instituted in response to the changing needs for institutional, apprenticeship and CET needs. Much has

been accomplished during the last ten years. The VITB is today viewed as a highly integrated and effective component of the total manpower training infrastructure of Singapore (Fig. 1).

Organizationally, it has a staff strength of 1,800 (of whom 1,200 are training staff) and has started to establish internal professional support in the areas of instructor training, curriculum development and instructional media development under a resource and staff training centre project (Fig. 2). Full-time institutional training is provided in 15 vocational institutes with an enrolment of 11,000 trainees, part-time CET programmes have a cumulative yearly intake of 46,500 and a further 6,000 apprentices are registered with the Board (Tables 1, 2 & 3).

Five formal systems of certification for about 70 different courses have been established for the Diploma in Applied Arts (DAA). Industrial Technician Certificate (ITC), Certificate in Business Studies (CBS), National Trade Certificate (NTC) and the Certificate of Competency (CoC). The NTC system forms the back-bone of the vocational training system and certifies trade skills at the semi-skilled (NTC-3), skilled (NTC-2) and highly-skilled (NTC-1) levels. A system of public trade tests has also been instituted for the existing workforce and is available in 25 NTC-2, 26 NTC-3 and 10 CoC trades (Fig. 3 & Table 4).

The rationalization of courses to meet training and industrial needs has also led to a more systematic development of curriculum. The Modular System of Training which embodies the concept of modules of employable skills was adopted in 1979. The curriculum is also progressively documented in terms of course structures, behavioural objectives, job sheets, phase tests, test plans and audio visual aids.

FACTORS IMPINGING VOCATIONAL TRAINING

Major structural changes have taken place in the various sectors of the Singapore economy since the early days of industrialization in the 1960s. The manufacturing sector, which was insignificant then, today employs about 30% of the total workforce of over 1.1 million. Strides have also been made in other sectors such as the services, communications and transportation, business and banking. The GDP of Singapore grew in real terms at an average rate of 8% per annum from 1974 to 1982. On the other hand, the workforce only grew at a rate of 4% over the same period. Demographic trends indicate that the rate will be even slower in the 1980s. The implications of this factor of limited human resource are far reaching. It means that every Singaporean who is willing and able must be provided with the opportunity to develop to his highest potential. Each Singaporean worker must be better educated and better trained to be more productive. Hence, the ever constant need to further refine, consolidate and improve upon the existing system of vocational and industrial training.

A second significant factor impinging upon the training system is the introduction of the New Education System (NES) in 1980 since students leaving schools constitute the major input to vocational training. With the implementation of streaming (a special feature of the NES), there will be a reconfiguration of the number and levels of educational attainment of school leavers. The NES is aimed at providing education according to the different capabilities of pupils. The implication for the vocational training system is that it must be able to attract the school leaver and match his abilities and aptitudes depending on the level of his education. There must be a strong incentive to reach

the highest potential both within the formal educational system and VITB's system of vocational training. There is a concomitant need to motivate the trainees to excel, to do one's best and to progress towards the next higher level of training.

Thirdly, Singapore has embarked on a strategy of high economic growth rates in the second phase of her industrialization programme for the 1980s and 90s. The move is towards high technology and skill-intensive industries. It is experiencing the rapid phase of technological transformation as a result of this policy of economic restructuring. Companies are upgrading their operations through the use of modern technology in manufacturing and moving towards higher value-added products. These changes in the industries have direct and long-term implications for the Board.

Technology in the form of expertise or sophisticated machinery may be imported with relative ease. The necessary technical and trade skills must be acquired through proper training. Whereas, it might previously have been sufficient for a school leaver to enter employment and learn on-the-job, pre-employment institutional training has become a necessary and critical step to meet the increasing demand of skilled manpower for high-technology industries. Such training not only provide the basic and higher level knowledge and occupational skills for employment but ensures that the trainee has a proper foundation upon which to develop his human potential during working life. A better educated and trained workforce must be developed in order to sustain the continuing growth of industries. The Board therefore sees, as one of its main objectives, its ability to provide a critical interface between the educational system and the world of work for a large proportion of school leavers. It is also very necessary that the Board actively promotes a training partnership with employers and unions in providing opportunities for upgrading the education and skills of existing workforce.

RECENT DEVELOPMENTS

In response to the three emerging factors which impinge upon the vocational training system, the Board examined its directions and has further consolidated its system. The more significant of the recent developments and present features will be described.

Expansion Of Training Capacity

The first major direction was to substantially increase the institutional training capacity. The blue print for this development is based on broad manpower projections of the Council on Professional & Technical Education under the Ministry of Trade and Industry. Three concerns were examined in-depth viz, the availability of sufficient school leavers, ability to attract the projected number of trainees under a voluntary system of education and training, and appropriateness of available courses in meeting the academic attainments of targeted groups of school leavers under the New Education System.

As a result, VITB's capacity for vocational training will be gradually built up to reach 24,100 by Jan 1986, as against an enrolment of 11,000 today. On-going development projects totalling S$110m at the close of financial year FY82 include the building of three new vocational institutes and re-equipping and expanding existing institutes. On completion, the VITB will be able to receive an annual intake of 15,100 students directly from schools as compared to its present intake of 8,000. Of the future intake, 6,000 will be primary school-leavers, 3,000 GCE 'N' holders and the remaining 6,100 GCE 'O' holders.

Refinement Of Training System

Much efforts were also focussed on the vital process of transition from schools to vocational training and its qualitative aspects. I would like to highlight three significant features which have been built into and contributed towards the further consolidation of the system of vocational training in Singapore (Fig. 4).

The first of these features is the development of a closely-linked system of progression from schools to the VITB. In particular, a mechanism of automatic registration to facilitate and ensure a high rate of progression has been jointly introduced by the Ministry of Education and the Board. The Automatic Registration System was pilot tested in December 1982 with pupils who had completed their Primary School Leaving Examination with a success rate of progression of 70%. The rate of progression for boys was as high as 90%. Through this process, students who have completed Primary 8 Monolingual (P8M) and Primary 8 Extended (P8E) in the future and are not proceeding further in the school system will be automatically posted to one of VITB's fifteen vocational institutes. A referral system has also been established for the counselling and placement in vocational training of a smaller number of students who may leave school before completing their secondary education. Special promotional packages comprising films, sound slides and brochures have been developed to reach these potential groups of trainees.

Secondly, the system provides a wide spectrum of different courses at various levels to match the abilities and aptitudes of school leavers depending on his educational attainment. It is recognized that the linkage between the various levels at which students may leave school under the New Education System and the courses open to them in vocational training must be made as attractive as possible. The importance of this feature was demonstrated when the Board launched the higher-level full-time NTC-2 programme for the academically better qualified GCE 'O' level holders in July 1982. The response was overwhelming. A total of 19 NTC-2 level courses will be developed and gradually introduced over the next few years. In view of the New Education System, a new one-year Pre-Vocational Training (PVT) course

was conceived as an integral part of the system of vocational training to meet the needs of the least academically inclined P8M school leavers.

The underlying concept of PVT is to create a learning environment which stimulates the interests and establishes the self confidence of the trainee to further develop his personal potential. As a transitional but critical interface between the school environment and world of work, this one-year experience will enable the trainees to appreciate their innate abilities, aptitudes and learn some basic operative skills which are required in the major Manufacturing, Commerce and Personal Service & Household sectors of the economy. The PVT programme is being developed and will be pilot-tested in January 1984.

The mere provision of vocational training capacity is not enough to meet the demand of a highly-skilled and quality workforce. There must be strong incentive to reach the highest potential both within the formal educational system and VITB's system of vocational training. There is the concomitant need to motivate the trainees to excel, to do one's best and to progress towards the next higher-level of training. This, in essence, is the third feature of the present vocational training system. Recognizing this need, the Board in May 1983 introduced the Certificate of Merit (COM) for all its full-time institutional courses for outstanding overall performances. Only the top 5% of the final year examination candidates of each course may be awarded this Certificate in addition to other performance criteria.

The Certificate of Merit also provides a basis for the progression of outstanding trainees from one level of training to the next within and outside VITB's system of training. Internally, an NTC-3 Certificate of Merit holder can proceed directly to NTC-2 within VITB's system of training. Likewise, avenues are now available for those with outstanding performances to progress from NTC-2 to ITC, PCBS to CBS and ITC to the Diploma in Applied Arts in the relevant courses respectively. A formal external linkage has also been recently established with the Ngee Ann Polytechnic and Singapore Polytechnic for the progression of VITB's CBS and ITC graduates with the Certificate of Merit

to the respective full-time Diploma in Business Studies and Technician Diploma courses of the two Polytechnics. These avenues of progression within and outside the vocational training system represent important opportunities for young Singaporeans to realise their fullest potential and further enhance the system of vocational training.

Upgrading Of Existing Workforce

While the Board's main resources are directed towards the full-time pre-employment training of school-leavers, industry-based training and continuing education and training have assumed increasing roles to upgrade the existing workforce in an environment of rapid technological changes. Training must be viewed as a life-long continuing process for the upgrading of skills and knowledge.

In this connection, the Board is keenly aware of the need to keep abreast with changes in technology and occupational skills and its ability to be flexible and respond quickly. This need is presently supported by a network of thirteen trade advisory committees which provide professional advice on the development of occupational classifications, skills standards, and curricula. Feedback is also obtained by Board members and apprenticeship officers through regular visits to industries and supplemented by surveys when required. At the Board level, the close liaison and support of the unions and employers is further strengthened by a tripartite representation of the Governments, Employers and National Trades Union Congress (NTUC).

Under its industry-based training programme, the Board has been jointly developing various apprenticeship schemes with individual companies and trade associations. An Approved Training Centre (ATC) scheme was introduced in 1981 for companies capable of undertaking in-house training leading to VITB's certification. Today, there are 18 such Centres with a total training capacity of 860 places. Alternatively, workers, whether sponsored or on their own initiative, can upgrade themselves through the part-time skills development courses under the CET programme.

More recently, the Board has also taken on the task of developing and administering a Basic Education for Skills Training (BEST) programme for upgrading the English Language and Mathematics competencies of adult workers. The BEST programme which is aimed at a potential pool of 300,000 workers, represents the joint efforts of the Government, NTUC and Employers and is supported by the Skills Development Fund. Although the main objective was to facilitate the process of skills upgrading, the acquisition of a basic education will no doubt enable workers to participate in the productivity drives of the companies. The programme was launched as a pilot scheme in January 1983 with a most encouraging response. BEST classes are presently conducted in 39 NTUC/PAP educational centres, 88 companies, 18 Ministry of Defence Units and 5 VITB CET Centres. The total intake enrolment in July 1983 was 14,000. Workers who successfully completed the highest Modules (Modules 4 in English and Mathematics) are eligible to enrol in part-time NTC-3 courses under the CET programme.

While the VITB and other training institutions may meet the basic demand of skilled manpower, the Government alone would not be able to meet the diversified needs of industries. On the other hand, the need for an employee to acquire new knowledge and technical skills due to technological changes is fast becoming an inescapable part of modern employment. This is especially so in the light of the policy of economic restructuring in Singapore.

The Government has therefore, through the support of the Skills Development Fund Council, been actively promoting the concept and development of in-house training programmes. In particular, industries with specialized skills and manpower needs are encouraged to establish industry-group training centres to meet the needs of its members. The first of such centres, the Textile Garment Training Centre, was established in 1982. This was followed by the Singapore Hotel Association Training and Educational Centre in July 1983. The plan for establishing a Construction Industry Training Centre in early 1984 has been announced by the Ministry of National Development. Other options are being explored to increase the involvement of private companies and industry groups in the training and upgrading of the existing workforce as an on-going process.

CONCLUDING REMARKS

The 1960s and 70s may be viewed as the first phase in developing a basic structure for vocational training in Singapore. Many approaches and programmes have been tried and some instituted in response to meet the skilled manpower needs of the changing industries.

As Singapore moves into the second phase of economic development in the 1980s and 90s based on a policy of economic restructuring, the effective role of the vocational training system as an interface between the schools and world of work has assumed an increasing importance. A better educated and trained workforce must be developed. The main challenge facing the Board will be its ability to develop a flexible and attractive system of training which matches the aspirations of Singaporeans whose technical knowledge, skills and good work attitudes are essential to support the continuing growth of the high-technology industries.

A new breed of Singapore workers is envisaged for the 1980s; one who is not only technically trained but skills-competent and enlightened on his role in industry. With a higher level of general education and vocational training, such workers will be better prepared for the new challenges and in particular, have a proper foundation for life-long skills training and upgrading in an environment of rapid technological changes. The government alone cannot achieve this. The task of skills upgrading requires the support of unions and employers. More companies and industry groups will be encouraged to establish training centres to meet the needs of changing industries.

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TABLES & FIGURES

Table 1 - Full-Time Institutional Enrolment

	Courses	FY 73	FY 74	FY 75	FY 76	FY 77	FY 78	FY 79	FY 80	FY 81	FY 82
1	Diploma in Applied Arts								41	74	132
2	Industrial Technician Certificate	520	713	1,102	1,422	1,406	1,324	1,423	1,940	1,719	1,635
3	Certificate in Business Studies									640	810
4	National Trade Certificate 2								212	491	532
5	National Trade Certificate 3	4,005	5,063	6,885	7,016	7,113	7,345	6,727	6,280	7,043	6,619
6	Preliminary Certificate in Business Studies								371	324	147
7	Certificate of Competency	120	301	620	1,046	617	436	437	274	400	362
8	Other Commercial Courses							2,965	971		
9	Others	506	450	305	208	45	18	102			79
	Total	5,151	6,727	8,912	9,692	9,181	9,123	11,654	10,089	10,691	10,316

'FY Financial Year 1st April-31st March

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Table 2 Registration Of Apprentices

	FY 73	FY 74	FY 75	FY 76	FY 77	FY 78	FY 79	FY 80	FY 81	FY 82
Apprentices registered (cumulative) as at year-end	2,404	3,583	5,281	6,495	7,703	9,163	10,930	13,353	15,830	17,906
New Apprentices registered during the year	1,087	1,179	1,698	1,214	1,208	1,460	1,767	2,423	2,477	2,706
Apprentices completed training (cumulative) as at year-end	681	1,121	1,600	2,351	3,454	4,321	5,579	6,821	8,249	9,718
Apprentices who completed training during the year	200	440	479	751	1,103	867	1,258	1,242	1,428	1,469
Apprentices still in training as at year-end	1,633	2,258	3,362	3,623	3,511	3,897	3,198	5,133	5,871	6,078

Y Financial Year 1st April-31st March

COURSES	FY 79	FY 80	FY 81	FY 82
Industrial Skill Courses	3432	7214	9496	11246
Commercial Skill Courses	5150	2545	4120	5156
Academic Courses	12165	8591	13034	23150
Language Courses	-	1660	1764	2016
Foundation Programme	11695	6202	3038	2922
Personal Enrichment	5092	2876	-	-
Extension Education Programme (JTS)	300	50	-	-
Ad Hoc Courses	-	-	1197	2043
Total	37834	29138	32649	46533

Table 3 Continuing Education & Training Part-Time Enrolment

Table 4 Institutional & Public Trade Tests

Candidates	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
1 Institutional										
ITC	205	339	594	1,046	1,369	1,461	1,396	1,268	1,006	864
CBS	–	–	–	–	–	–	–	–	285	311
PCBS	–	–	–	–	–	–	–	–	323	296
Other Business Studies	–	–	–	–	–	–	–	1,265	465	–
NTC-2	132	123	130	476	614	505	650	638	897	917
NTC-3	3,279	3,148	3,012	4,667	5,948	5,787	5,562	5,710	4,411	4,303
CoC	789	395	531	942	734	698	402	459	74	23
Sub-Total	4,405	4,005	4,267	7,131	8,663	8,451	8,010	9,340	7,461	6,714
2 Public										
NTC-2	–	621	1,797	1,682	1,384	1,599	1,570	1,959	2,007	2,379
NTC-3	1,420	2,105	2,893	4,260	3,415	3,392	3,662	3,652	4,420	4,473
CoC	–	–	–	–	129	469	485	815	782	747
Sub-Total	1,428	2,806	4,690	5,942	4,927	5,459	5,707	6,426	7,209	7,599
Total	5,833	6,811	8,957	13,073	13,590	13,910	13,717	15,766	14,670	14,313

: Courses offered by former AEB.

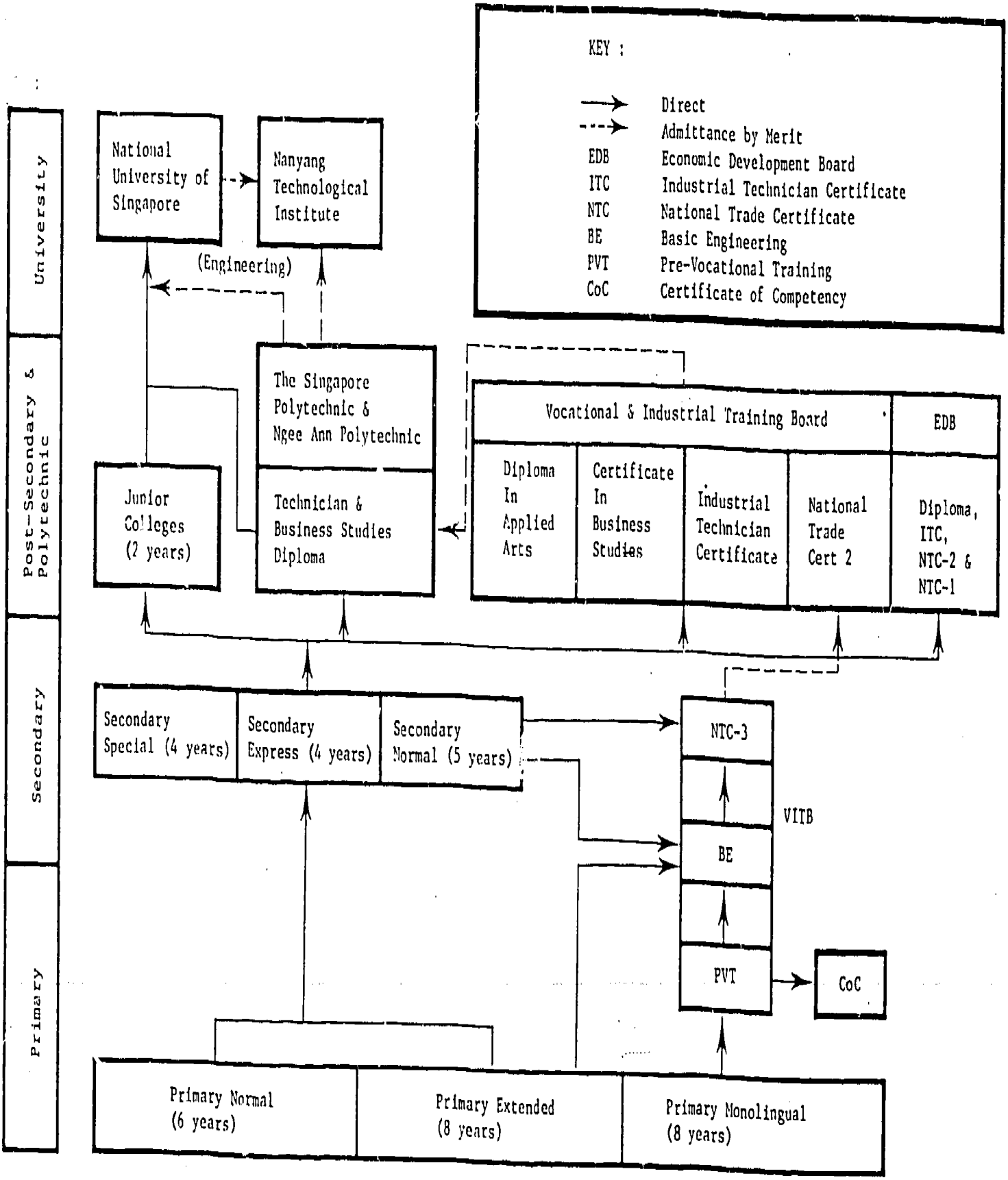
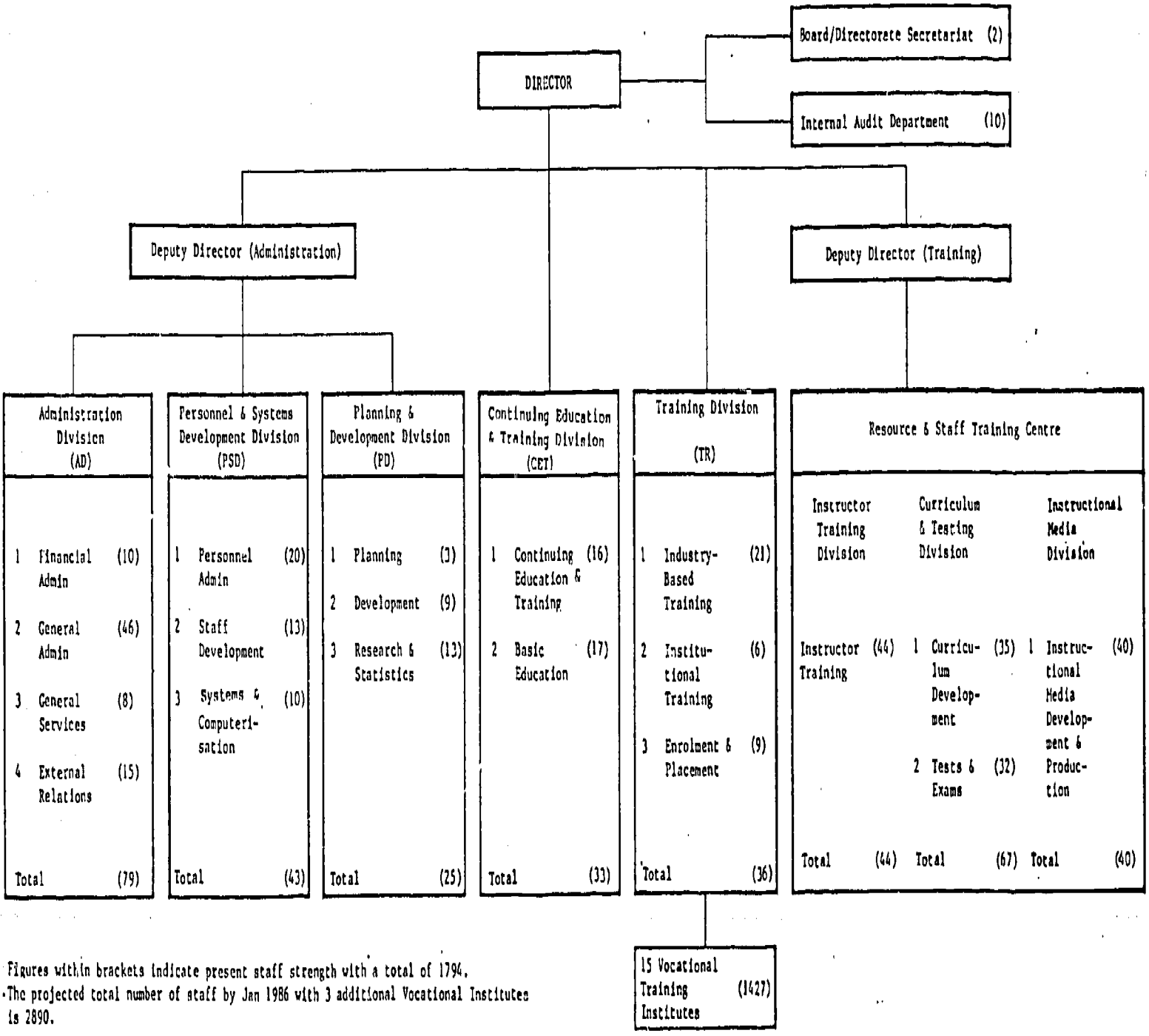


Figure 1 System Of Education & Technical Manpower Training In Singapore

Figure 2 VITB Organisation Structure



Figures within brackets indicate present staff strength with a total of 1794.
The projected total number of staff by Jan 1986 with 3 additional Vocational Institutes is 2890.

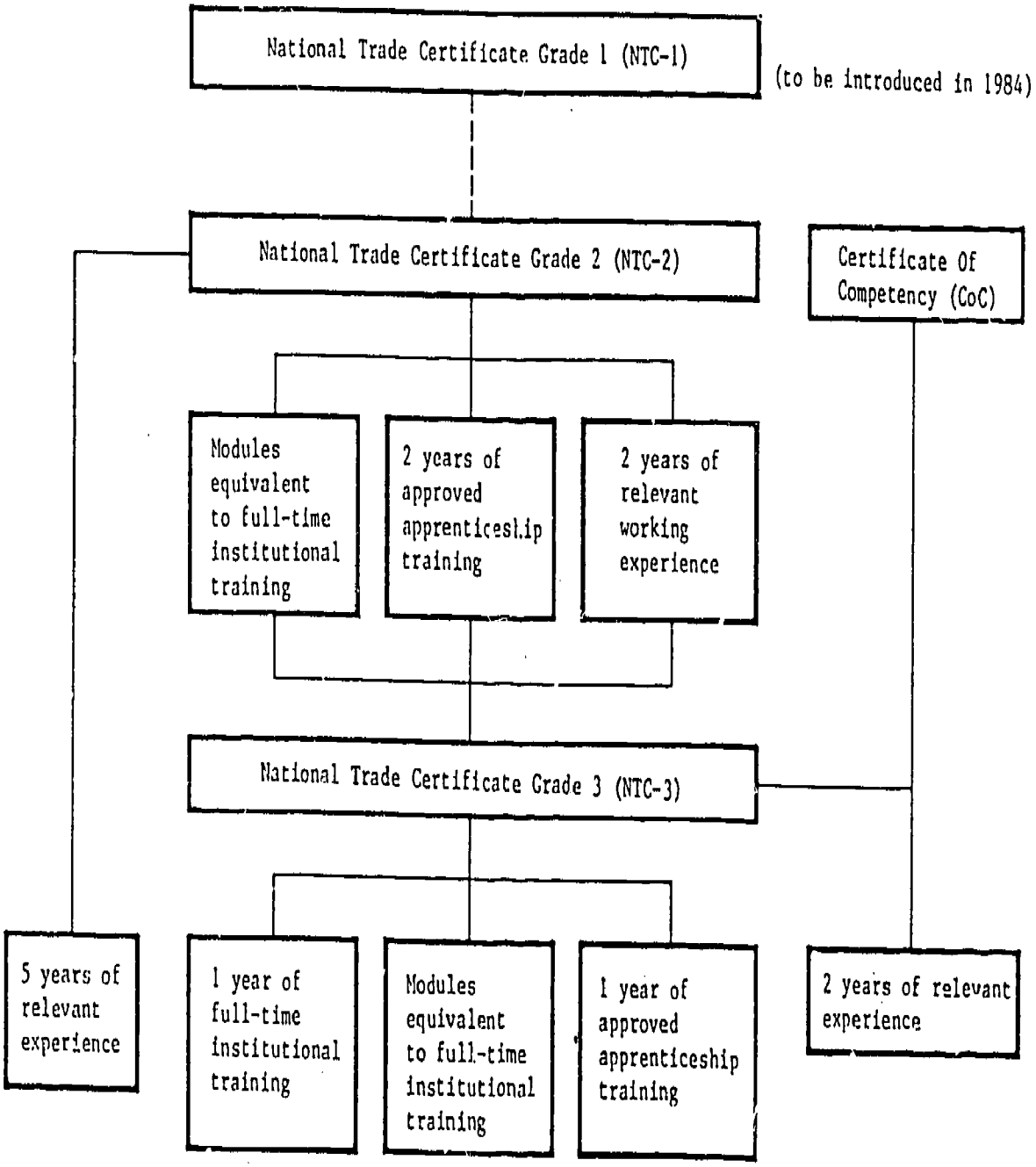


Figure 3 National Trade Certificate & Certificate Of Competency Systems

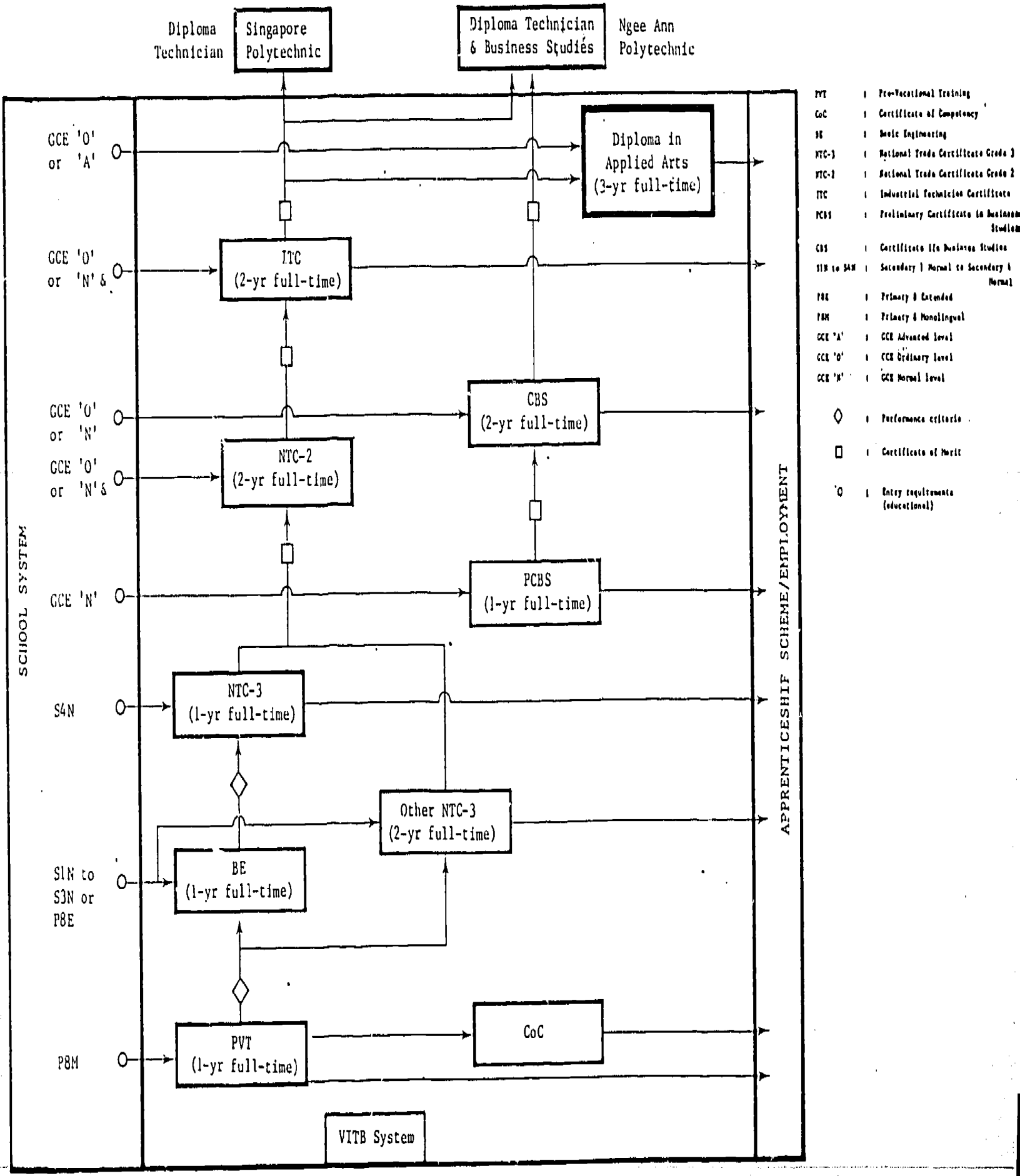


Figure 4 System Of Progression From Schools To Vocational Training