LITERACY AND TECHNOLOGICAL DEVELOPMENT

COUNTRY REPORT: SINGAPORE

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Singapore demands much of her people and has to work from a complex population base. To convert to high technological industries, she needs workers with adequate literacy and numeracy skills for training. Her people also need an adequate level of proficiency in English for education, work and living. Recently much attention has been given to developing basic literacy programmes at the pre-primary and primary levels. The communicative approaches used in these programmes are making the learning of language and reading enjoyable for the children. Fewer intervention programmes for literacy development exist at the secondary level or for workers. There is an obvious need for these and for 'second chance' and continuing education programmes.

A few other institutions support formal education measures. Use of educational technology in schools is an integral part of curriculum. Much government funds have been invested in provision of hardware, software and training. But high level coordination is required to maximise effects of such literacy programmes and attendant technology.

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INTRODUCTION: Literacy in the Singapore Context

There is no neat definition of 'literacy'. The concept of being literate is relative to cultural expectations and national needs. It depends on the function of literacy in any one society. In some developing countries, 'literate' may mean merely the ability to recognise words on a page while in other countries, 'literate' may describe the ability to read a newspaper, write a letter or keep accounts with ease. In more technically advanced countries a person may be deemed semi-literate unless he is able to comprehend written instructions in a technical language. (1) In Singapore, the definition of literacy has been changed from 'the ability to read and write a simple letter' in the 1957 census to 'the ability to read with understanding a newspaper in a specified language' in the censuses of 1970 and 1980. This reflects a rise in literacy level over the last 20 years. Such a rise was further demonstrated in the 1980 census when it showed students as being better able to read newspapers in 2 or more official languages than the general population. (2) In the Singapore context, there are three types of literacy that are catered for to differing degrees:

1. **BASIC or INITIAL LITERACY** concerns the mastery of the elements of reading, writing and number concepts by young children and illiterate adults. Pre-primary and Primary school programmes provide such instruction for the young.
FUNCTIONAL LITERACY concerns the extension of basic literacy for effective functioning at work. Intervention programmes at the upper primary, secondary, pre-vocational and adult education levels provide for this kind of instruction. Singapore's growing demand for high technology industries and a versatile workforce has lead to increasing emphasis on literacy training that enables workers to continue upgrading or diversifying their skills.

ADVANCED LITERACY concerns the pursuit of further educational skills for reasons of self-development, enrichment, added versatility and effectiveness at work. Continuing adult education classes, advanced language courses, and computer courses are available for these purposes.

As in most countries, literacy programmes in Singapore must provide for vertical demands of literacy from Basic to Advanced levels. But in Singapore, the literacy programmes also must provide a majority of the population with the lateral demands of achieving functional literacy in both the native language and a nonnative language (English). This quest for bilingual if not multilingual versatility is an added complication.

STATUS OF LANGUAGE AND LITERACY

As previously indicated the task of achieving literacy in Singapore is a complex one because of the multiracial composition of its 2.5 million population, viz Chinese (76.4%), Malays (14.9%), Indians (6.4%) and Others (2.3%). The choice of the medium of instruction becomes a sensitive but crucial one. Presently there are four official
languages; English, Chinese (Mandarin), Malay, and Tamil. English is the language of education and administration. English is also the survival language for a workforce that deals heavily in commerce, industry, technology, and investment with the West. Therefore, high priority is given to beginning language programmes in English for pre-school and school age children. On the other hand, bilingualism is also an important government policy and second language instruction is part of the curriculum from pre-school to university levels.

Despite the complexity of the language situation, the general literacy rate or number of literate persons in every 100 persons aged 10 years and over is estimated at 86%. The 1980 population census indicated that the majority of Singaporeans at that time were literate in only one official language, the greatest number mainly Chinese with English coming second. Yet both further education and employment depend on adequate proficiency in English.

A number of factors indicate a stronger trend towards such proficiency in English. First, there has been a noticeable shift in school enrolment from non-English medium to English-medium primary schools. Secondly, programmes promoting Basic and Functional literacy in English are being implemented in childcare centres for pre-school children, and in primary and secondary schools, and special programmes are available to adults on the job. Agencies such as the Ministry of Education and its Curriculum Development Institute, the Institute of Education, the Regional Language Centre and the British Council have joined forces to develop these programmes for the school-age population and the Vocational and Industrial Training Board is responsible for the
adult literacy programme. Further promotion of literacy is provided chiefly by the National Library, the National Book Development Council, and the Society for Reading and Literacy (a national affiliate of the International Reading Association).

Momentum is increasing also for the pursuit of Advanced literacy. Singapore has made significant progress in developing computer literacy by taking steps to promote computer use for the learning of mathematics and by beginning to promote computer-assisted language learning.

CURRENT PROGRAMMES OF LITERACY

Preschool Programmes

Because of the increased numbers of working mothers, the need for more child care centres and kindergartens with trained personnel became evident. In 1985 the Institute of Education responded to this need by developing an 150 hour course for Child Care Centre Trainers and a 60 hour course for Kindergarten teachers. Upon completion of the 150 hour course, the qualified Trainers assist in the training of large numbers of Child Care Centre personnel. To date, 20 such Trainers are assisting in the training of other personnel and about 100 additional Kindergarten teachers are trained yearly. (5) In both cases, heavy emphasis is placed on early language learning through an integrated language arts approach. This approach features story telling, reading of stories to the children using the Shared Book Approach and utilising the children's own language in the Language Experience Approach to introduce printed text. (For further description of these two approaches see Discussion on page 8 below).
Simultaneously, the Institute of Education has been working on Singapore's first large, long term study of kindergarten children. Begun in 1983, this "Project on the Cognitive and Social Development of Preschool Children in Singapore" is funded by the Bernard Van Leer Foundation of the Netherlands. This 'IE-BVL' project has completed its first 3-year phase during which data on selected aspects of the cognitive and social development of over 2000 children aged 3 - 6 were collected. The Institute expects to extract from this data implications for both parents and teachers which will help them improve the preschool education of their children (6).

Early data collection indicated a need for improved English teaching techniques in the existing preschools. In 1986, the two integrated language teaching approaches mentioned above, the Shared Book and the Language Experience Approaches, were tried out in a few centres to cater to this need. Based on positive feedback from these trials, early in 1987 an intervention team began training preschool teachers in the use of these approaches.

Preprimary and Lower Primary Programmes

An increased emphasis on the importance of the early childhood years for learning prompted the Institute of Education to offer a preservice training course specifically for students to specialize in teaching preprimary and lower primary children, 5 to 8 years old. It is a two year full-time course which leads to a Certificate in Education, Preprimary and Lower Primary. Students graduating from this programme have completed, among their other courses, an 120 hour Language Arts course which focusses on the Shared Book and Language Experience
Approaches to teaching English (7).

Another Lower Primary programme is based on data gathered by the Reading Skills Project team at the Institute of Education in 1983 and 1984. The recommendations of this team were to use the Shared Book and Language Experience Approaches to improve the pupils' English literacy. Based on this research, in 1985, the Reading and English Acquisition Programme (REAP) was launched by a team from the Institute, the Ministry of Education, and the Curriculum Development Institute. Beginning with all of the Primary One teachers in 30 primary schools, workshops were conducted to train these teachers to use the two integrated language approaches in conjunction with the materials they were already using. After training, teachers were supported by individual monitors for the rest of the year in order to ensure a full implementation of the programme (The training aspect of this programme was presented at the LLA Conference in 1985) (8).

In 1986, new Primary One teachers in these schools and in additional schools were trained while the original group of teachers moved up to Primary Two. Within a few years more, nearly all of the Lower Primary teachers in Singapore will have been trained in these techniques. To date, 962 lower primary classes in 132 (out of about 200) primary schools are in REAP. Continued monitoring of the programme indicates statistically significant differences between REAP and non-REAP children, with REAP pupils performing slightly better in all of the listening, speaking, reading and writing tasks tested. This data is supported further by comments from teachers and principals who have said that the REAP children's use of English and their positive attitudes toward reading are very obvious (9).
Upper Primary Programmes

Two programmes promote literacy in the upper primary classes, the Active Communicative Teaching (ACT) course for teachers of the normal stream pupils and the Learning Activity Programme (LEAP) for teachers of the slower stream pupils.

ACT was first offered as an inservice course in 1986 by the British Council and the Regional Language Centre for the Ministry of Education. Catering for upper primary teachers, it is an 80 hour course spread over six months. It includes lectures and three classroom observations by the trainers. The aim is to train all upper primary teachers in Singapore to use ACT's communicative language teaching techniques so as to carry on from where the REAP teachers finished at the end of Primary Three. As of March 1987, 1248 upper primary teachers have attended the course and are at various stages of implementing the communicative techniques in their own classes (10).

LEAP provides specially designed instructional materials for pupils who have difficulty coping with the normal upper primary classes. Established in 1983 by the Curriculum Development Institute of the Ministry of Education, the LEAP team developed multi-media, multi-level instructional kits for Language Arts, Mathematics, Science, and Prevocational topics (The Language Arts component of LEAP was presented at the LLA Conference in 1985). While appealing to the interests of children 10 to 14 years old, these kits cater for the instructional needs and abilities of slower than normal pupils. These instructional kits are available to all primary schools and teachers have attended workshops on their use. The language kits provide an integrated
language arts programme highlighting communicative language activities, books appropriate for the Shared Book Approach and other related materials (11).

**Discussion**

The most exciting aspect of all of the language teaching programmes mentioned above is the trend toward integrated and communicative language teaching. The Shared Book and Language Experience Approaches, which are common to all of the preprimary and lower primary programmes as well as to LEAP in the upper primary, deserve further comment.

In the Shared Book Approach (11) children are exposed to English through enlarged storybooks. The teacher reads the stories to and with the children in a simulated bedtime story situation. The approach is based on evidence that children who learn to read early and easily are those who have shared stories with parents at home from an early age, a situation that is not especially common in Singapore. The Language Experience Approach (13), complementary to the Shared Book Approach, integrates the four language areas of listening, speaking, reading and writing. Children learn to use English through activities which can be discussed, written down, then reading their own words put into writing.

Singaporean children are enjoying their development toward literacy in English through exciting stories and through meaningful language learning activities. Teachers are learning new, more child centred language teaching techniques and are being rewarded by their pupils' increased success and interest.
Secondary School and Vocational Training Programmes

At the post primary school level, literacy programmes aim to improve the functional effectiveness of literacy and numeracy in preparation for later occupations. One such programme is called the Project to Assist Selected Schools in English Skills (PASSES). This programme was initiated by the Ministry of Education in 1984. Its aim was to help secondary schools whose 'O' level English results were consistently below the national average or whose need for assistance in language teaching was apparent. An ongoing programme, its strategies include close collaboration with principals and staff, conducting needs analyses with the staff by developing and administering diagnostic measures, planning and conducting workshops in areas of need such as composition, grammar teaching, more creative use of textbooks. The PASSES team has introduced Extensive Reading programmes, and in some schools, the Uninterrupted Sustained Silent Reading Programme. Teachers are assisted in planning remedial programmes, given demonstration lessons, monitored in the classroom, and generally provided with much moral support. Beginning with 20 schools in 1984, PASSES has expanded to more than 30 schools with 8 Specialist English Inspectors involved. Students are reported to be reading more and teachers are pooling their resources more efficiently (14).

Since its inception in 1979, the Vocational and Industrial Training Board (VITB) has been playing an increasingly important role in advancing the literacy standards of adult Singaporean workers in both commerce and industry. While its primary role has been to provide vocational training through multiple certification courses conducted in 16 institutes, VITB has traditionally provided the administrative
machinery for running part-time Continuing Education classes for workers and young school leavers. In addition, within its own training courses, provisions are occasionally made for attending to literacy advancement. Such is the case for the programme called Pre-Vocational Training (PVT), designed for primary school leavers from the slower than normal streams. While chiefly providing vocational training and orientation towards necessary work habits, attitudes and discipline, PVT also includes components aimed at increasing the students' competence in basic literacy and numeracy. On completion of PVT, the students go on to VITB's other vocational training programmes. (15)

In 1983, a serious obstacle to a Singapore government economic policy surfaced. Singapore needed to shift quickly to high-technology industries. But it was estimated that a target 320,000 Singapore workers still had either less than a primary school education or had a secondary education in a non-English medium. A higher literacy level that included a higher proficiency in English was imperative before such workers could be trained in high technology work skills. In conjunction with the National Trade Union Congress, the VITB acted in response to the government's need to upgrade its workforce. The VITB was charged with the implementation of a national programme for workers called 'Basic Education for Skills Training' (BEST).

The BEST programme offers courses in English and Mathematics in four 60 hour modules with the aim of equipping workers with literacy and numeracy skills needed for the VITB's Continuing Education and Training programmes. Private employers are encouraged by the government to view BEST as a long term investment, to facilitate rescheduling of shifts,
and to provide teaching rooms on company premises. The VITB arranges for expertise in publicity, organisation, instruction and materials including textbooks and videos. BEST Programmes are funded by a government agency called the Skills Development Fund. (16)

By early 1987 about 87,000 workers had participated in BEST and more than 390 companies had organised BEST classes. VITB has also sponsored a series of seminars on adult education to help maintain and improve the professional skills of BEST teachers. A further programme called Worker Improvement through Secondary Education (WISE) is being planned by the VITB to be piloted in 1987 beginning in September. This programme aims to prepare successful students from BEST for English and Mathematics at the national school leaving exam level (17).

Continuing Education

Continuing education for literacy can take two forms: 1) repeated attempts to master basic literacy or 2) advancement toward the functional literacy required of secondary school leavers. Beyond these levels, it can be viewed as continual upgrading toward advanced literacy. In Singapore, intervention programmes such as PASSES, PVT and BEST provide formal, organised channels for pursuing the first two levels. The Extramural Studies Department of the National University provides continuing adult education through informal, non-credit courses for both functional and advanced literacy.

Over the last 20 years, the Extramural Studies Department has been expanding its service. From an enrolment of about 2000 students in 64 extramural courses (various subjects) conducted in 1964 directly by the
National University of Singapore, the enrolment in 1986 had increased to about 15,000 in 824 courses. By drawing on the expertise of the University and other institutions, these courses help adults become better equipped for the rapid changes taking place in society. Some of the courses are linked to national campaigns eg. Mandarin classes. (18)

The courses in greatest demand are those related to language (Language and Literature, Mandarin, other Asian Languages) and Computer and Technology courses. (19) Courses preparing students for 'O' level examinations are also popular. This trend indicates a growing awareness of the importance of English literacy, both functional and advanced. A wide spectrum of Singapore's residents benefit from these courses as there are no entrance requirements for most of the courses. The recent policies of decentralising the centres and of introducing participants to new approaches to learning help to overcome the awkwardness of "going back to school".

PROMOTION OF LITERACY

While certain institutions have specific teaching roles, other organisations in Singapore help create a conducive and supportive environment for the promotion of literacy. Organisations like the National Library, the National Book Development Council, and the Society for Reading and Literacy provide the public with both materials and information about print and about reading.

National Library

The National Library, established in 1958, provides loan and reference services at the Central Library and its six branches
strategically located in the population centres of the island. In addition, it has two part-time branches and seven bookmobile service points at Community Centres. The library provides materials and reference services in the four official languages and is presently building up its generally collections of materials in Malay, Mandarin, Tamil and English. The library serves as a legal deposit library, a collection centre for all Singapore publications and recently it became the central agency for the Singapore Integrated Library Automation Service (SILAS). This service operates a national bibliographical network among the major libraries of Singapore. Library membership is free to all citizens and permanent residents, and according to the 1985 Fiscal Year Report, its membership stood at about 840,000. Since nearly 40% of its members are adults, the Library is making a deliberate attempt to reach out to schools, parents, nursery and kindergarten teachers. However, in terms of actual loans, while adult and teenagers' loans together amount to 54.7% of total loans, children's loans have actually reached 45.3% of total loans.

The Library's plans for expansion include increasing its book collection (presently at 2.3 million books, as at end of fiscal year 1985) and establishing another two branch libraries in fiscal year 1988. Its latest developments are in the direction of computerisation of the library system, expanding the use of audiovisual services, initiating library-user education programmes for primary and secondary school teachers, and organising a wide range of programmes to promote reading to children and young adults throughout the year.
More than any organisation outside of the school system, the National Library has promoted reading to massive numbers of people. Promotion activities include story-telling sessions for children, full participation in national reading campaigns, organising book talks and films for schools and talks for parents and other age and interest groups. Between 1983 and 1985 the number of books on home loan increased five times, clear evidence that the Library's promotion of literacy is effective (20).

National Book Development Council

The National Book Development Council of Singapore (NBDCS) was conceived at a 1966 UNESCO meeting in Tokyo on book production and distribution in Asia. Although it is not a government agency, NBDCS acts as a national agency representing all sectors of the book industry including authors, book designers and illustrators, printers, publishers, distributors, librarians, reading educators, and promoters of reading. Its role is to coordinate activities of all these sectors and to encourage formation of new societies such as the Society of Singapore Editors. Its ultimate functions are to promote reading and to liaise with the national and international book world. NBDCS offers advice recommendations and training courses for improving book production, publishing and book distribution. It also organizes research and investigates factors that affect promotion of reading in Singapore by conducting national readership surveys and relevant seminars. (21)

The Council has inaugurated book awards for various categories of books, compiled a list of Books in Print in Singapore, started a
Translation Scheme for subsidizing the translation and publication of suitable Singapore works that are originally available in one language. (22) It has sponsored publishers for training abroad, sponsored librarians and educators for international conferences and at a local level organised training services. Its two most visible services are perhaps its organization of the annual Singapore Book Fair and the National Reading Fortnight (or National Reading Month 1982, 1984). From modest beginnings, in 1969, the Singapore Book Fair has grown to become the most important book event of each year and attracts an impressive array of publishers and distributors from both Singapore and its Asian neighbours.

The National Reading Month, initially a biennial event, has become the National Reading Fortnight to be held annually as from 1986. Throughout the 1987 fortnight, numerous institutions and organizations ran book-related activities concurrently in all parts of Singapore. (23)

Society for Reading and Literacy

Inaugurated in July 1985, the Society for Reading and Literacy (SRL) has quickly established its role in Singapore as the 'Reading Association'. While the National Library and NBDCS promote books and reading, the SRL provides educational input towards the promotion as well as understanding of reading and approaches to reading instruction. Workshops for parents and teachers such as "How to put the fun back into reading," "Understanding the reading process," and "Helping Children with Reading Difficulties" proved to be popular with both members and nonmembers. Such workshops have undoubtedly been influential in the increase in membership from 50 in 1985 to its present membership of 200.
In addition to these workshop series, resource persons from the membership comply with requests for occasional talks to child care centres, volunteer helpers, libraries, schools, and even private companies. As a National Affiliate of the International Reading Association, and an affiliate to the NBDCS, SRL is able to tap the resources of these other organizations. Notable speakers such as Professor Marie Clay of New Zealand have obliged the Society with talks or lectures. SRL is also able to participate in the larger reading promotion activities such as the National Reading Fortnight (24).

TECHNOLOGICAL DEVELOPMENT

As in many countries, modern technology is used more and more in the promotion of literacy. In 1981 the Singapore Ministry of Education launched a $45.6 million development project to upgrade audiovisual resources in all schools built before 1981. Fresh standards of provision of audio-visual resources have been drawn up for schools that fall under this category. Every school or junior college now either has been equipped or can equip themselves with audio cassette tape recorders, overhead projectors, a colour TV receiver, a video cassette recorder, a sound filmstrip projector, projection screens, a dry mount press, a transparency maker, overhead projectors, storage facilities for these, and all types of software. Funds are also available for maintenance and replacement of all AV resources. Presently, schools are allocated funds for AV resources based on enrolment figures and school level ($6.00 - $8.00 per student) with an additional maintenance sum for schools with language laboratories (+$5.00 per student).

The Curriculum Development Institute of Singapore (CDIS)
established in 1980 as a branch of the Ministry of Education has played a vital role in bringing together technology use and literacy-development in schools. The strength of CDIS curriculum packages lies in being multimedia and in their catering for students of different abilities. The core materials are printed materials but these are accompanied by charts, audiotapes, slides and tape-slides, films, overhead transparencies, video cassettes and even games, masks and puppets and wigs. Accompanying Teachers' Guides help teachers integrate the use of the printed materials with the audio-visual software. While 3 divisions of CDIS - the Department of Asian Languages and Moral Education, the Dept of English Language and Social Studies and the Dept of Sciences and Special Programmes - design and write the packages and disseminate their use, a fourth division - the Department of Technology (DET) - perform several crucial functions. This division promotes the use of educational technology in schools, develop the audiovisual materials for CDIS curriculum packages, produce educational television (ETV) programmes, make AV materials available for loan to all schools and develop computer education programmes. The Educational Television (ETV) Production Unit of DET has designed and developed programmes that range from a mini-series of four to a one-year series of 28 programmes depending on the needs of the curriculum for the subject.

Supplementary audio-visual materials ranging from language kits to audio and video cassettes and films are available from the Instructional Materials Library (IML) a branch of the Department of Educational Technology. The Materials Library to date has a collection of over 40,000 such items selected by 18 selection committees. Schools are informed of resources available through catalogues and monthly accession
lists compiled by subject areas and sent out regularly to schools. Resources are loaned to schools as well as individual teachers, while a delivery service is available to schools in more remote areas of Singapore. The Curriculum Development Institute with its Educational Technology Division and the Instructional Materials Library are co-located with the Institute of Education. This is to ensure that curriculum development and teacher education are coordinated.

The use of computers in education, although in beginning stages, has not caught up with their extensive use in other fields such as industry and science. By 1983, the Ministry of Education had provided an average of three microcomputers for each of its 134 secondary schools and in 1984 a subsidy scheme assisted schools in purchasing more. (25) With the help of DET computer specialists, 'A-level computer science' is now a subject in Junior College Curriculum, and Computer Appreciation Clubs have been set up in secondary schools. Teachers who run the Computer Appreciation courses are initially trained in a 100 hours Computer Appreciation course run by the same DET computer specialists. The Computer Education Section of DET also runs a Computer Science Resource Centre where software, instructional materials, latest periodicals and demonstrations of new hardware as well as on-call advice are available to all teachers. (26)

The emphasis to date has been on computer literacy and computers for mathematics. The use of computers for language teaching is still in the feasibility study stage.
Training courses to prepare teachers and other educational staff in computer literacy are available from the Ministry, the Institute of Education, the Curriculum Development Institute of Singapore as well as from outside organizations. In 1986, computer literacy courses became compulsory for all Diploma in Education trainees. (27) In preparation for an expected shift towards Computer Assisted Language Learning, recent attempts have been made by the Institute of Education to survey and assess available software for such a purpose. (28)

**SUMMARY**

In Singapore, programmes for literacy are flourishing at the pre-school and primary school levels. Their long term success depends largely on the care with which implementation strategies are maintained, monitored and constantly improved through independent and coordinated efforts of the several educational institutions involved. A major advance in the quality of basic literacy programmes should ensure that Singaporean children will learn to read and write in a more efficient yet enjoyable way than ever before. Achievement of greater language proficiency together with positive attitudes towards learning is a worthwhile investment for Singapore.

Currently, Singapore is diverting more attention towards achieving excellence in the quality of secondary school education. The fact remains however that more programmes are needed for 'second chance' education in basic literacy and numeracy for the upgrading of the present workforce. Singapore could also benefit from having more agencies that could support the present efforts to respond to a society which is becoming more aware of the importance of literacy.
There is a constant need to coordinate literacy programmes at a national level so that resources, funds and expertise can be channelled to wherever the need is greatest and where the effects can be the most lasting. This is even more so when educational technology is being used for literacy instruction. There is then a need for literacy programmes to reanalyse objectives, refine selection and teaching methods (29) not only to justify investment but most of all to ensure that through skilful combination of materials, technology and teacher expertise, the learner primarily is served, while technology is used.

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