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## Making Teacher Education Responsive and Relevant

GOH Chor Boon and LEE Sing Kong

Teacher education is currently facing a number of challenges as the Singapore society and economy mature and, in the face of globalization, as its young citizens experience a multitude of cultural and technological influences. Globalization, in the new millennium, will have an impact on education from all perspectives—how we teach, what we teach, where we teach, whom we teach, and even whether we teach. New technologies not only have given teachers new tools for the classroom that have created instant and powerful connectivities between persons and ideas, across space and in real time, but also fundamentally alter our notions of what it means to teach. Within the virtual worlds of e-mail, chat rooms, virtual classrooms, and even multiplayer gaming environments, individuals from cultures and societies around the globe are interacting with a frequency that was unimaginable even a decade ago. These powerful technology-related learning environments are not culture free, but carry with them very powerful cultural content preloaded in the cyberspace curriculum and preset by transnational forces that demand sameness rather than separateness. Globalization, too, means that the transfer of technologies and expertise has brought transnational organizations into local education markets through both physical and virtual connections across space. Teachers today will have international students in the same learning space at the same time.

New technologies have not only changed the role of the teacher but, in many situations, also made the traditional teaching roles redundant for many educators.

This chapter examines how Singapore goes about developing a quality teaching force, the processes and characteristics of which have constantly been admired by many governments all over the world. After a brief historical introduction, the chapter focuses on the challenges of teacher education in the

21st century, how Singapore's Ministry of Education (MOE) builds and sustains a quality teaching service in light of these challenges, and the role of the National Institute of Education (NIE) in supporting this achievement.

## TEACHER EDUCATION AND TRAINING PRIOR TO 1991

Teacher education and training in the 1960s was more of a bane than a boon. Recruitment of teaching staff was a major problem. A report of the Education Commission set up by the government in April 1962 concluded that teachers were overworked and exhausted from teaching six days a week, and "for the teachers and students, health has been affected, morale lowered" (*Straits Times*, Apr. 17, 1962). Because of the poor level of education of the workforce, it was not possible to recruit trained teachers in large numbers from any one source. To fill the gap, Singapore resorted to large-scale recruitment of teachers-in-training who, while undergoing training at the Teachers Training College (TTC), assumed partial teaching responsibility in schools. The standards of teaching in these teacher-trainees were closely monitored and supervised by the TTC lecturers and senior teachers in schools. Up to 1964, it was not possible to recruit a sufficient number of teachers-in-training with the requisite minimum qualifications. To provide an incentive, in March 1962, the government decided to give women teachers equal pay with their male colleagues.<sup>1</sup> Salary adjustments were gradually made and, by 1965, the lower salary scale of women teachers disappeared.

When Singapore gained its independence from Malaysia in August 1965, the education service was staffed with, in the words of Lee Kuan Yew, "teachers who are undedicated because of the nature of recruitment" (Lee 1966, 7). The then-prime minister resolved to rectify the situation because "in my experience—both as a pupil in school and in universities, and subsequently in trying to teach people large, simple political ideas—the most important person is the man who is in charge of the boy" (Lee 1966, 7). At this stage, however, the priority was to achieve universal primary education as soon as possible. The quality of teacher training was put aside as mass recruitment of teachers was needed to staff the rising number of schools. The number of pupils in Singapore increased from about 246,000 in 1957 to 520,000 in 1967, and nearly 10,000 teachers went through TTC (Department of Statistics, various years). In the process, this unprecedented expansion negatively affected the teaching profession as "crash programs had to be mounted in large numbers and often standards had to be diluted" (Lun and Chan 1983, 16). As reported in the *Straits Times* (Jan. 28, 1968), "Administrative and teaching staff are preoccupied with routine work and have little time for reflection, innovation and self-improvement; the part-time students are under heavy pressure of work—both school and college—and hardly able to do justice to either; curricular reforms are urgently awaiting; comparable standards between

the different language streams need to be defined and maintained; necessary teaching materials have to be compiled.”

After years of rapid educational expansion, the demand for teachers was perceived to have stabilized by 1970. Attention was shifted to improvement in the system and structure of teacher training in Singapore, especially teaching in secondary schools as the bulk of the primary school population moved into the secondary level. The rapid expansion in secondary education in the 1970s posed enormous problems in curriculum implementation in schools and at the teacher-training level; the call was made for a certain degree of specialization. New aspects of education, such as bilingualism and technical and vocational training, were also imposed on the teacher-training program. The qualitative aspect of teacher training now came to the fore, and a greater emphasis was placed on science and mathematics, technical and vocational training. At the institutional level, in early 1969, it became clear that further development of the TTC was hampered by the fact that it was administered as a government department. Promotion was stringently regulated and, as a result, there was a constant turnover of staff. This was not conducive for the attainment of good professional and academic standards. In the meantime, the teaching profession was perked up by the government's announcement of better salary scales and working conditions in 1971.

A milestone development took place in April 1973 when the TTC was revamped and became the Institute of Education (IE) and was administered as a statutory board. It was designated as the only “one-stop” teacher-training institution in Singapore for teachers at all levels in Singapore's schools, including inservice training for qualified practicing teachers. This is unlike many other countries where teacher education is carried out in a variety of institutions: teacher-training colleges for primary school teachers, and advanced colleges of education and education departments in universities for secondary school teachers. The government initially planned that the IE would have the authority to confer its own degrees, starting with the BEd and going on to postgraduate degrees in education. However, the proposed degree was shelved indefinitely, but the postgraduate programs were introduced and conferred by the University of Singapore (and later by the National University of Singapore).

The overarching mission of the IE was to improve the quality of teaching in schools. Immediate measures were taken to upgrade the faculty and facilities of the training campus. In line with the Singapore government's practice of putting the best people in positions to lead its public organizations, the IE progressed rapidly through the competent guidance of several directors from 1973 to 1991, beginning with the appointment of Dr. Ruth Wong as its first director. Under their leadership, the professional and other training programs of the IE had been subjected to reviews and changes. Many faculty members were given grants to pursue higher degrees. One significant development in these upgrading efforts was the government's appointment of Dr. William Taylor, then the director of the

University of London's Institute of Education, as the consultant to IE in upgrading professional standards.

In the 1980s, the IE made concerted efforts to establish a research culture among its academic faculty and to boost postgraduate work. Through staff development programs and recruitment drives, the number of staff with doctorates in education increased during this period of time. A center for educational research was set up. However, the roots for the growth of a research culture were slow to germinate. While the call was made for staff to conduct research and publish, the majority of the faculty were still classroom practitioners. It was difficult to alter attitudes overnight. At the MOE, the emphasis and direction was to train effective teachers strong in pedagogical methods and classroom management. Research was not a priority. Inevitably, a tension between IE and the MOE developed, and the relationship was often on a roller coaster. The gulf between the administrators and bureaucrats in the MOE and the school and academic researchers in IE seemed uncompromising. But the rift did not last long.

A landmark institutional change took place in 1991, when the present NIE was created. This signaled the beginning of an intimate working relationship between NIE and its various stakeholders, especially the MOE and schools. A high-level committee was formed to look into the next stage of development in teacher training.<sup>2</sup> It was also part of the government's effort in fine-tuning the tertiary sector to support its private-sector-driven economic modernization strategy, based on the development of science and technology. Good teachers were required to nurture Singaporeans with strong foundations in science and mathematics at the primary level. The outcome was the launch of degree programs for primary teacher education because, as stated by the committee, this is "in recognition of the importance and increasing complexity and demands of primary teaching in a fast-paced, technological society" (IE and CPE Development Committee 1990, i). The committee also recommended, "Many reputable teacher colleges overseas are coming or have come under the ambit of universities to enhance their standing and that of their degrees. Following this trend . . . NIE should become part of a university so as to clearly establish a tertiary status for itself and its degree programs" (IE and CPE Development Committee 1990, 6). In 1991, NIE became an autonomous institute of the Nanyang Technological University (NTU) with its own management council.

## A NEW ERA IN TEACHER TRAINING

It is now universally accepted that student learning—and, hence, the quality of teacher education—are the key to 21st-century economic success. In developing and developed countries alike, political leaders and education policy makers constantly have education and the challenge of preparing high-quality teachers at the top of their agenda. Singapore is no exception. The success of what Singapore hopes to achieve in education hinges on the quality of its teachers.<sup>3</sup> They form

the most vital component of the country's organizational capacity. Teachers must be dedicated to the vision and mission of education, understand the rationale behind education policies, and be committed to their own professional development. In turn, they will be well trained and equipped to nurture, challenge, and inspire their charges in schools. These precepts guided the recruitment and training of teachers in the 1990s and beyond. Up to the mid-1990s, however, the MOE had difficulties in getting teachers and was able to achieve only about 55 to 70 percent of its annual targets (*Straits Times*, Mar. 21, 1996).

Singapore's education service is more vibrant today as a result of past efforts to improve its appeal to potential teachers through more competitive remuneration, faster promotions, and strong emphasis on continual upgrading and professional development. In 1996, the Singapore government implemented wide-sweeping changes in the salaries and promotion prospects in the education service, estimated to cost about S\$420 million a year (Department of Statistics, various years). The incentives were also applicable to trainee teachers who now received a teacher's salary, including service benefits, instead of a bursary. In 2001, a move was initiated to look into the promotion tracks and performance incentives for teachers and, after a few years of preparation, a new system of assessing teacher performance was introduced in all schools.

The overall objective of the government was to attract and retain good people to preserve and further enhance the quality of Singapore's education system. Further improvements and monetary incentives have been introduced in the past few years, including greater autonomy given to school leaders, a performance bonus system, and a performance management system to reward good performance and help retain teachers. Today, the Singapore teacher enjoys competitive starting salaries, as shown in tables 4.1 and 4.2.

**Table 4.1 Starting Salary for Graduate Teachers (in S\$)**

BEFORE NIE AND DURING NIE TRAINING		
Qualifications	Gross starting salary	
	Without NS	With NS
Pass degree	\$2,472	\$2,822
Honors	\$2,647 to \$2,822	\$2,997 to \$3,172
AFTER NIE TRAINING		
Qualifications	Gross starting salary	
	Without NS	With NS
Pass degree	\$2,585	\$2,939
Honors	\$2,762 to \$2,939	\$3,115 to \$3,292

Source: <http://www.moe.gov.sg/teach/SalaryBenefits.htm>

Note: NIE = National Institute of Education; NS = National Service (for males).

**Table 4.2 Starting Salaries for Nongraduate Teachers (in S\$)**

BEFORE AND DURING NIE TRAINING		
Qualifications	Gross starting salary	
	Without NS	With NS
Polytechnic diploma* (technical)		
Year 1	\$1,779	\$1,978
Year 2	\$1,879	\$2,077
Polytechnic diploma* (nontechnical)		
Year 1	\$1,586	\$1,779
Year 2	\$1,663	\$1,879
A-level		
Year 1	\$1,431	\$1,586
Year 2	\$1,509	\$1,663
O-level		
Year 1 and 2	\$800	\$800
Year 3	\$1,431	\$1,586
Year 4	\$1,509	\$1,663
AFTER NIE TRAINING		
Qualifications	Gross starting salary	
	Without NS	With NS
Polytechnic diploma* (technical)	\$2,028	\$2,226
Polytechnic diploma* (nontechnical)	\$1,829	\$2,028
A-Level	\$1,630	\$1,829
O-Level	\$1,630	\$1,829

Source: <http://www.moe.gov.sg/teach/SalaryBenefits.htm>

Note: NIE = National Institute of Education; NS = National Service (for males); A-Level = Advanced Level General Certificate in Education; O-Level = Ordinary Level General Certificate in Education.

Teachers are now promoted through three “fields of excellence”: the teaching track, the leadership track, and the senior specialist track.<sup>4</sup> Besides remunerations that are compatible with (or even better than) beginning lawyers, engineers, and even medical doctors in the government service, each teacher is entitled to 100 hours of fully subsidized professional training per year. A Connect Plan provides monetary reward for teachers who stay in service more than a certain number of years. Finally, in the spirit of lifelong education, school leaders and teachers are encouraged to take sabbatical leave to pick up new knowledge and skills—and

not necessarily in an education institution, but in other sectors as well, such as the hospitality industry.<sup>5</sup>

The MOE has also been raising the public profile of the teaching service by actively marketing its teaching scholarships and awards, publicly recognizing exemplary teachers, and highlighting good stories to the media. Other initiatives have been launched to further improve the staffing situation in schools. A part-time scheme for teachers was introduced. In addition, schools were given greater flexibility in deciding how best to organize and deploy their teaching resources according to their needs. The MOE has also created more administrative and support posts (e.g., full-time counselors) while streamlining work procedures.

Beginning teachers are being inducted into the profession through a series of talks and enrichment courses prior to leaving school for full-time teaching positions. At the school level, they continue to receive mentoring sessions from experienced teachers. This hand-holding during the first year or so helps to prevent the early exit of freshly trained teachers who are now facing the full realities of teaching in schools.<sup>6</sup> All said, Singapore is perhaps one of the few countries in the world to provide a generous employment package to retain teachers and maintain a high-quality teaching force. The country wants to produce a world-class teacher education so its citizens can lead the country into the next lap of development in the new century. The success of Singapore's attempt at attracting and sustaining the teaching population and providing a quality learning environment is reflected in tables 4.3 and 4.4.

There is no question that Singapore's teachers are accorded professional status and enjoy public recognition. However, teaching in the small city-state is a very demanding job. Besides the need to consistently upgrade professional knowledge

**Table 4.3 Total Number of Teaching Staff, 2001–05**

	2001	2002	2003	2004	2005
All schools	23,507	24,685	24,914	25,716	26,382
Primary	12,065	12,423	12,925	12,209	12,343
Secondary	9,552	10,246	10,830	11,240	11,495
Pre-university	1,890	2,016	2,059	2,267	2,544

Source: Ministry of Education 2006.

**Table 4.4 Ratio of Students to Teaching Staff**

	2001	2002	2003	2004	2005
Primary	25.1	24.4	24.9	24.3	23.5
Secondary	19.6	18.9	19.1	19.0	18.5

Source: Ministry of Education 2006.



and skills and nurture young Singaporeans in character development and core values, the teacher today also has to develop a high level of technological literacy. The teacher must be prepared to teach in the classroom and school of the future. The MOE is establishing a new primary school in 2008 to serve as a model for how students can be prepared for a future dominated by technology and information. It will be one of the 15 “schools of the future” the government envisioned in its 2015 Intelligent Nation plan to exploit the latest information and communication technology to transform various sectors. As the country is well on its way to transform into a fully “wired” and “virtual” life and work environment in the near future, the teacher has to incorporate best-of-class technology solutions in nearly every area of the learning environment, including curriculum delivery, school–home–community collaboration, content creation, and assessment.

## EXCELLENCE IN TEACHER EDUCATION: THE ROLE OF NIE

NIE is well positioned to support Singapore’s education vision of the new millennium. Established in 1991 and positioned as one of NTU’s schools and institutes, NIE has more than 50 years of progressive institutional history to fall back on. But it was in the 1990s that NIE finally took off on a trajectory of sustained growth. Its move to the new 17-hectare, S\$400-million, purpose-built campus, situated within NTU, enabled it to expand its range of preservice and in-service training programs. Table 4.5 shows the intake figures of trainee teachers since 2000. Note that about 30 percent of the entrants are male. Many developing countries have difficulties recruiting male teachers. In the case of Singapore, concerted efforts, both past and present, at improving the professional status (including compensation packages) of teachers has produced a steady inflow of male teachers. NIE now has set out to achieve two broad targets. First, helmed by its vision of “Towards an Institute of Distinction,” it constantly invents and reinvents itself to achieve excellence in teacher training. Second, NIE works toward establishing a strong tripartite relationship with the MOE and the schools.

In response to the nation’s need for quality teachers, NIE conducted a comprehensive review of the teacher training curriculum in 2003. It adopted a series of measures or approaches to develop a comprehensive teacher education framework:

- An expert consensus-building approach. This relies on experts in teacher education to reach a consensus on high-quality indicators and to use them to judge the quality of particular teaching preparation programs. One of the key tasks of the review was to articulate what attributes were required of the beginning teachers across the three preservice programs in NIE.<sup>7</sup>
- A research-based approach. The task is to obtain research evidence to arrive at a set of evidence-based postulates or determinants regarding teacher education.

**Table 4.5 Intake of Teacher Trainees, 2000–07 (as of August 2007)**

Academic year intake	Intakes (in July and January)	Male		Female		Total	
		No.	%	No.	%	No.	%
2007/2008	July 2007	555	29	1,343	71	1,898	100
2006/2007	July 2006 January 2007	686	31	1,504	69	2,190	100
2005/2006	July 2005 January 2006	791	32	1,690	68	2,481	100
2004/2005	July 2004 January 2005	621	34	1,218	66	1,839	100
2003/2004	July 2003 January 2004	599	32	1,303	68	1,902	100
2002/2003	July 2002 January 2003	783	29	1,901	71	2,684	100
2001/2002	July 2001 January 2002	678	28	1,730	72	2,408	100
2000/2001	July 2000	570	28	1,454	72	2,024	100
1999/2000	July 1999 January 2000	616	28	1,617	72	2,233	100
1998/1999	July 1998 January 1999	671	29	1,609	71	2,280	100

Source: National Institute of Education 2006.

An in-depth review of the recent literature on research in teacher education to learn how and why other countries go about preparing their teachers was conducted. This process was useful for decision makers to discover the latest trends, issues, and concerns in teacher education, such as subject knowledge, foundational educational knowledge, teaching practice models, quality control, and assessments.

- A professional-consensus approach. This draws upon the wisdom and best practices of experienced school leaders and teachers in the education system. Major stakeholders (principals, the MOE, faculty, students) were asked about NIE graduates who have gone on to teach in schools to gauge how effective their preparation has been, what further attributes principals and the MOE would like to see in new teachers, and best practices that were promoted in schools.

The overall framework articulates in broad areas the skills and knowledge components that are desired in a beginning teacher, with the underlying core values as the basis of the curriculum. To ensure standards, NIE has an international advisory panel to review holistically NIE's role and functions as well as its strategic thrusts; included in these is the quality of its teacher preparation programs.

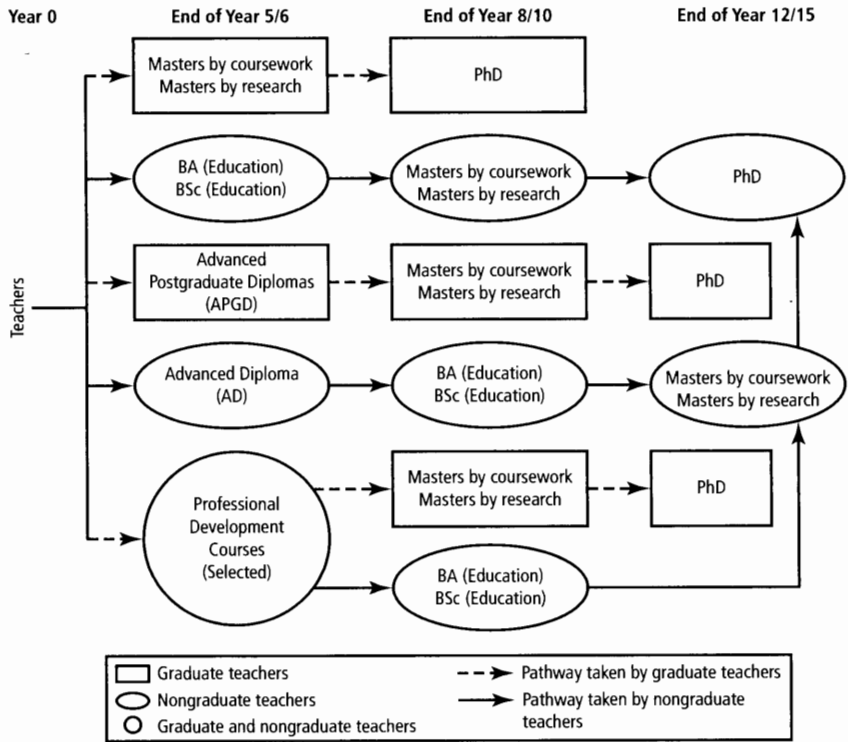
External examiners/assessors look at each of the programs. At the academic subject and curriculum studies level, external examiners/assessors have been appointed for each academic discipline. To strengthen NIE's international presence and networking, deans of eight world-class teaching training institutions recently convened at NIE and signed a document that marked the birth of an international alliance.<sup>8</sup>

Apart from preparing new teachers for the schools in Singapore, NIE has an equally important role of keeping the country's 28,000 teachers in the schools and the MOE abreast of the latest changes in classroom teaching and school administration. In today's context, teachers do not just teach within the four walls of the classroom. The teacher is the key to everything we do in education. Teachers must be equipped and supported to carry out their roles and responsibilities effectively in the classroom and beyond. This requires a shift in the teacher's perception of his or her professional role. A teacher must be able to create a learning environment in which experimentation is not stifled, where creative thinking and intellectual inquiry thrive, where change is perceived as a challenge toward a better education. Above all, teachers need to not only prepare their charges to develop and excel academically, but equip them with life skills, values, and attitudes. Singapore's MOE and NIE recognize that teaching is a multifaceted and demanding profession; hence, beginning teachers must be trained to meet the basic level of competency needed for them to function effectively in schools. In addition, there is a need to promote a culture of continuous learning among the serving teachers. Responding to the 100 hours of annual professional development time, which every teacher is entitled to, NIE has developed a comprehensive framework to provide different pathways for teachers to upgrade themselves. In 2004, the Professional Development Continuum Model (PDCM) was introduced. Under the PDCM, professional development for teachers is considered as a continuation of the preservice program. It is based on the philosophy that teachers must pursue learning on a lifelong basis so that they can be relevant to the students.

The PDCM framework provides different pathways for teachers to participate in a whole range of professional development modules. At the end of each module, teachers can choose to be assessed and, in the process, are able to accumulate academic credits. Through a building-block approach, the cumulative number of academic units can permit the teachers to obtain formal certifications such as advanced diplomas, advanced postgraduate diplomas, and master's degrees. The different pathways under the PDCM framework are illustrated in figure 4.1.

NIE's curriculum is effectively translated by close to 400 faculty members and supported by about the same number of administrative support staff. One outstanding feature of the institute's academic staff composition is the presence of academic content colleagues (in the humanities and sciences) among

Figure 4.1 PDCM Framework



the pedagogues. Over the years (since 1991), this combination of “content” and “pedagogy” staff under one roof has been inextricably synergized into an integrated, all-in-one model of teacher training, in which the student-teacher is able to upgrade his or her content knowledge and link the content with the latest pedagogy approaches. This unique feature is seen by many international observers as a success formula for NIE’s remarkable rise as one of the premier teacher-training institutions in the world. To streamline the organizational structure and promote efficiency, NIE in 2000 embarked on a bold move to discard the traditional schools model (such as School of Arts, Science, and so forth) and, in its place, a program-driven matrix structure was adopted. Content and pedagogy staff alike are not compartmentalized and segregated into schools; instead, collectively, they contribute to one or two of the program offices: the Foundation Programs Office and the Graduate Programs and Research Office.

As part of the NTU’s set-up, NIE has to focus on academic research as one of its key performance indicators of excellence. Although research in teacher education began in the 1980s, the research culture was not well grounded when NIE began its institutional history in 1991. It took more than a decade of persistent

effort to cultivate a research environment. Action-based research in schools was also actively promoted and, in this respect, the support from the MOE was invaluable. Teachers were encouraged to participate in research that has direct impact on the quality of teaching in the classroom. One effective way is to increase the enrollment of teachers in postgraduate programs. NIE ensured that its higher degree programs stayed relevant to the needs of the MOE and schools. Admittedly, it took several years of internationally recognized research by the NIE faculty to convince the MOE in 2002 to approve an unprecedented funding of S\$48 million to develop the Centre of Research in Pedagogy and Practice in NIE. Groundbreaking research findings on pedagogical issues in the Singapore classroom are now meticulously scrutinized by the MOE, and, if necessary, new policies or changes will be introduced. Many governments in the developed world would think twice about investing heavily in research and development in education, but for Singapore, it is yet another clear signal of the importance the government places on the provision of quality education to young Singaporeans.

However, despite the significant impetus given to research and the need for NIE academic staff to be prolific in their academic publishing, there is a need to address the issue of a category of staff who are essentially “true-blue” teacher trainers—staff who had years of teaching experience in the school system before becoming academic staff of NIE, but whose strengths are in delivering quality teaching, not academic research. One strategic approach NIE is reviewing is to develop a “teaching track” performance management framework that enables the practitioners to be promoted to full professors. Another issue of concern is the theory-practice linkage within the teacher-training curriculum. While the practicum component of the preservice training requires student teachers to be attached to schools for a period of about 12 weeks, NIE is still mindful of feedback provided by schools that more could be done to customize education theories, such as in classroom management and learning motivation, to the real world of the classroom and school. To ensure that the desired outcomes of teacher training are achieved and that the curriculum stays relevant and responsive to the needs of the schools, longitudinal studies that track the performance of cohorts of beginning teachers are conducted by NIE.

## **NEW ECONOMY, NEW CHALLENGES FOR NIE**

Singapore has successfully made its transition from the Third World to the First. The city-state is seen by the international community as one of the most competitive and open economies. The government actively promoted a brain-gain policy by welcoming talents from all over the world. At the same time, Singaporeans are urged to move out of their comfort zones and market their talents and expertise to the world. The rise of the new economy requires young Singaporeans to see that

survival in the 21st century means the acquisition of 21st-century skills. Workplace competencies are now more complex, requiring workers to possess complex problem-solving skills, communication skills, inductive and deductive reasoning skills, creative thinking, and an innovative mind-set. The worker in the new millennium has to be intelligent, technologically savvy, and able to pick out pertinent and relevant knowledge from abundant sources of information. Access to telecommunications and technology has caused shifts in power from nation-states to multinational corporations, public and private economic entities, socio-cultural groups, and even individuals. Indeed, informed citizens worldwide are beginning to articulate wider principles, policies, and politics of “global awareness.” Central to these efforts is the belief that trade, investment, and technology are not ends in themselves; they are tools for promoting the ideals of equality, democracy, good jobs, a clean environment, and healthy communities.

Increasingly, young Singaporeans, as digital natives in this Digital Age, need the knowledge and capabilities to interact with peoples of various ethnicities and cultural background. They need to be sensitive to the role that culture plays in the behaviors, beliefs, and values of themselves and others. The advent of new communications technology only makes this sensitivity more imperative. Within the virtual worlds of e-mail, chat rooms, virtual classrooms, and even multiplayer gaming environments, individuals from cultures and societies around the globe are interacting with a frequency that was unimaginable even a decade ago. Increasingly also, Singapore’s classrooms will have more young foreign students sharing their knowledge and experiences.

These are the new challenges facing education in Singapore, and the leaders in various capacities are proactively responding to these challenges. At NIE, a Learning Sciences Laboratory unit was set up in 2005 to harness advanced technologies into the teaching and learning process. Plans are already in place to carry out research and development (R&D) in interactive digital media (IDM), which has great potential for teaching, learning, and inculcating values in a fun and engaging manner. These R&D activities are aimed at developing useful IDM-based pedagogies, tools, and content to foster students’ deep learning. Within the formal curriculum, there are modules and enrichment programs that the student-teachers could enroll in to promote multicultural literacy and global awareness.<sup>9</sup> To work cooperatively with individuals from vastly different backgrounds, student-teachers must appreciate and understand the beliefs and values that drive them. Being culturally literate would enable our young to see the dangers of stereotyping and other biases and remain aware of and sensitive to issues of racism and prejudice.

At the instructional and curriculum level, NIE made provisions for teaching the relatively new skills and understandings that would enhance the student-teachers’ capacities to handle the impact of globalization. They would then be able to

transfer these skills to their students in schools at certain appropriate points of the school curriculum. Gardner (2004, 253–255) has suggested that these skills and understandings include the following:

- *Understanding of the global system.* The trends of globalization need to be understood by the young people because they are operating in a global community. As digital natives, they are totally comfortable with technology, and yet could be all alone while communicating in a crowded superhighway.
- *Capacity to think analytically and creatively within and outside disciplines.* The Academic Studies modules of the initial training programs in NIE are taught for in-depth disciplinary understanding, focusing on the analysis of principal ideas and approaching them from different perspectives, including pertinent references to other disciplines.
- *Knowledge and ability to deal with people from different cultural backgrounds.* NIE recently launched the Group Endeavors Service Learning initiative, which provides opportunities for student-teachers to participate in local and international projects, especially in developing countries in Asia. This component of the teacher-training curriculum enhances cultural understanding, fosters a sense of tolerance for others, and establishes a closer link between the various ethnic groups in Singapore and between Singaporeans and people in the region.

Finally, NIE places strong emphasis on the training of school leaders—heads of departments, vice principals, principals, and superintendents. This is one area of teacher education and training that tends to elude the attention of policy makers in developing countries. NIE customizes its leadership program to match the changing demands on school leaders. The departmental heads program, known as the New Diploma in Departmental Management, provides an intensive experience that prepares these middle-level management leaders for the new and challenging context of leadership. The 17-week program gears them toward leading change in dynamic and innovative ways. It introduces participants to some important concepts of direct relevance to their jobs: team learning, curriculum innovation, and dynamic learning systems. The participants learn through a diversity of experiences (such as from their peers and from visits to schools to see models of good practice) designed to generate new knowledge. They also have the opportunity to tailor their own training program by selecting modules (by themselves or with their principal's input) that are of direct use to them.

The task of the school principal has shifted from one who manages to one who innovates. He or she leads through innovative actions and decisions in entrepreneurial leadership, knowledge management, global leadership, ethical leadership, and social responsibility. NIE's state-of-the-art school leadership program, known

as the Leaders in Education program, is designed for selected principals-to-be, and it prepares them for leadership in schools. The six-month program is future oriented, with an emphasis on leadership capability in a dynamic and complex context. Through a process of learning in diverse contexts, including the authentic workplace of the school and international locations, the learning platform addresses a range of issues that are seen as critical to the success of future leadership. They include designing and managing learning school organizations that can sustain a competitive advantage in a fast-changing and turbulent environment, strategic choice and marketing, innovative communication and information technology, designing an integrative and innovative curriculum to achieve excellence in teaching and learning, and building human and intellectual capital.

### **SOME LESSONS FROM THE SINGAPORE EXPERIENCE**

In the 1960s and 1970s, Singapore leaders, too, grappled with the task of creating a teacher education system that could solve the more serious educational issues during this period, such as high educational wastage, unequal educational performance by the races within Singapore society, and the concern regarding some minority ethnic groups being marginalized in the rapidly developing country. As elaborated in other chapters of this book, the Singapore government assumed full control of steering the directions of education change by implementing a slew of policies, some deemed to be unpopular and draconic. The curriculum, including textbook writing and publication, with its emphasis on English literacy and bilingualism, was standardized and strictly under the purview of the MOE. Centralized control in all aspects of education at this time was crucial, however, because it allowed the government to introduce changes quickly and monitor outcomes effectively.

Unlike the situation in many developing countries, Singapore put strong emphasis on teacher education based on the premise that if teacher salaries were high enough and working conditions good enough, the education system would have less trouble finding enough teachers of high quality. The MOE recognizes that teaching is a multifaceted and demanding profession, particularly for the beginning or novice teacher. One major lead-in measure to induct new teachers is off-loading one-fifth of the normal responsibility load in their first year in schools. This policy came into effect in January 2000. The released time is then spent on classroom observations of experienced teachers and on-the-job training to enable them to settle in. Continual upgrading of serving teachers is also a key priority. Every teacher is expected to undergo at least 100 hours of professional training, the expenses of which are fully covered by government funding. Teachers are also given approved study leave (with either half- or full-monthly pay, depending on the years of service) to gain new knowledge and skills through academic pursuits. In short, the MOE continues to look into ways to enhance the status and image of



the teaching profession. These include giving more public recognition to outstanding teachers and holding official presentation ceremonies for recipients of teaching scholarships and awards.

Training of teachers was also centralized under one institution, and this framework ensured some uniformity of standards at the preservice and inservice levels (at least, in terms of content knowledge and pedagogical skill mastery) in all novice and experienced teachers. In this respect, another critical factor for Singapore's success in the provision of quality teacher education is the creation of a well-planned, well-staffed teacher-training institute, as in the case of NIE. The institute itself is still evolving and continuously building on its institutional strengths to provide the country with its articulate, knowledgeable, and creative teachers.

How does one explain the seemingly "seamless" flow of decisions and actions among NIE, the MOE, and the schools? Unlike some developing countries, where bureaucratic red tape and overly protective jurisdictions imposed by government departments work against each other, NIE, the MOE, and the schools gradually metamorphosed into an organic operational network, with the primary, overarching objective of planning, teaching, and nurturing the future leaders of Singapore. This network operates on a formal and informal platform of professional sharing of knowledge, problems, and issues; policies; resources; and needs. Cloning of such an institutional working relationship in other cultural and political contexts may not result in the same effectiveness and positive outcome as happened in Singapore's case.<sup>10</sup> Besides the key organizations (such as the MOE and NIE), there is an entire government machinery helping in myriads of ways.

In the final analysis, the key lesson to be learned from an understanding of Singapore's planning and development of its teacher education and training system is that education and teacher education must change in tandem whenever the need arises. But many education ministries and teacher education institutions in developing countries may not be up to the task, mostly because of their resistance to change. For Singapore, the major stakeholders—the MOE, NIE, and the schools—perceived that the key issue of globalization versus diversity, the need for high-quality preservice programs, and well-managed and supported integration of new teachers into the teaching force and ongoing professional development for that workforce will lead to two major factors that will impinge on the teaching profession in the future: the need for the teacher to become a consistent, reflective practitioner and the need to use rapidly developing technologies, both information and communication technology and other learning technologies, in an increasingly effective manner to promote high-quality learning for all students.

Understandably, educational systems, especially those that have existed for many decades in developing countries, are inherently conservative institutions, and change is often resisted. But globalization will create inevitable changes. For teacher education and training in Singapore, remaining unchanged will lead to

degeneration. NIE will continue to work closely with the MOE to meet its demand for quality teacher training, to refine existing practices, and to adopt best practices and models that can meet different needs arising from the changes in the national and global landscape. The strategy is to keep what is useful from the past, integrate it with the newness of the present, and be ready for the future. And the whole cycle repeats.

## NOTES

1. In the final year of training, male teachers were paid S\$168 plus a variable allowance of S\$42–S\$210 per month, and female teachers were paid S\$160 plus a variable allowance of S\$40–\$200 per month.

2. The Institute of Education (IE) and the College of Physical Education (CPE) Development Committee was formed in August 1989 to examine two key issues in teacher training in the 1990s: the need to merge the IE and the CPE, and the upgrading of primary teacher education. Its report was titled *Teacher Training in the 1990s: Issues and Strategies*.

3. The age profile of teachers is changing rapidly as senior teachers (recruited during the 1960s and 1970s) retire from the service and young teachers join the service. By 2010, about 25 percent of the present teaching workforce will have retired or reached retirement age. The median age of teachers has declined from 43 years in 1996 to 38 years in 2000 and 33 years in 2005. Thus, training is integral to the development of a quality teaching service. To ensure a smooth transition from the older to a younger generation of teachers, we need to facilitate the imparting of wisdom, values, and experiences. Several measures were introduced to safeguard against this loss of desirable values and accumulated experience of the senior teachers when they retire. Besides inviting retired teachers to continue as “relief teachers,” the MOE introduced an innovative scheme known as the Adjunct Teacher Programme in 2000. Adjunct teachers can be appointed either on contract or on more flexible working arrangements, to ensure that they still have time to pursue numerous other activities. There are currently more than 500 adjunct teachers engaged by schools, and about 60 percent of them are retirees.

4. A groundbreaking system of assessing the quality of Singapore’s teachers was introduced in 2005. Known as the Enhanced Performance Management System, it is a competency-based model that encapsulates the knowledge, skills, and professional characteristics appropriate for each of the three fields of excellence. The system involves regular coaching and feedback between teachers and their reporting officers.

5. Teachers in aided or mission schools in Singapore also receive the same working benefits and promotion prospects as do their counterparts in the mainstream government schools. They are either MOE employees or “aided staff,” that is, employees of the aided or mission school. Apart from their religious affinities, aided schools operate under the same governance framework as the government schools.

6. Attrition rate of teachers is a serious problem in many developing countries and even in industrial nations like the United States. In the United States, for example, it could be argued that much of this attrition is due to novice teachers being given the most difficult classes and left very much on their own to teach and manage the unruly students. See Kelly (2004) and Riggs and Sandlin (2007).

7. The three different preservice programs offered by NIE are the one-year postgraduate diploma in education, the two-year diploma in education, and the four-year BA/BSc (education).

8. The event took place on August 21, 2007. The international colleges involved are University of Aarhus, Denmark; Beijing Normal University, People's Republic of China; University of London, United Kingdom; University of Melbourne, Australia; Seoul National University, Korea; University of Toronto, Canada; University of Wisconsin, United States; and National Institute of Education, Singapore. The alliance aims to hold constant dialogues on teacher education and exchanges of educational research information.

9. Defined simply, multicultural literacy is the ability to understand and appreciate the similarities and differences between the customs, values, and beliefs of one's own culture and the cultures of others.

10. The tripartism model has its roots in the 1960s, when then-Prime Minister Lee Kuan Yew had to struggle against a militant left to establish industrial peace so that foreign investment would flow in and jobs be created. Hence, the critical link between the government and the unions was established. Cabinet ministers were appointed to head the unions, while unionists were invited to sit on statutory boards so they could learn to understand and appreciate the problems the government faced.

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