

Chapter 5

Teacher Training: The Backbone of the ICT in Education Masterplans

“Teachers are the key to the success of this programme. The Masterplan therefore provides for a comprehensive teacher-training programme — all teachers will be trained to use ICT in their lessons by 1999.”

— Teo Chee Hean, Former Minister for Education
(1997–2003), at the launch of the
First Masterplan for ICT in Education, July 1997.

SETTING THE STAGE

Basic ICT Skills Training

One of the key dimensions under the First Masterplan (mp1) was Human Resources Development or Teacher Training, identified as the backbone of the plan. Teacher training comprised two components: ICT skills training and ICT-based pedagogical training. In 1996, the Ministry of

Education (MOE) saw the need to equip teachers with basic ICT skills to meet their individual administration and teaching requirements. IT POWER21, a compulsory ICT skills training programme for all teachers was implemented for this purpose. As this training involved mainly ICT skills, it was outsourced to ICT training companies. Under this programme, as many as 22,000 teachers were trained in the use of the Internet, MS Office Suite, and various other language font sets such as Chinese and Tamil.

Introduction of ICT-Based Pedagogical Training

The ICT-based pedagogical training implemented in 1997 involved the effective use of technology in teaching and learning. Teachers had to be equipped with a new set of skills, attitudes and knowledge in the use of ICT. The ICT Training Branch of MOE's Educational Technology Division (ETD) oversaw the implementation of ICT-based teacher training for all schools. It was responsible for developing an effective and sustained strategy and timetable for training teachers in the integration of ICT into the curriculum. This was a colossal task as there were about 24,000 teachers in over 300 Primary schools, Secondary schools and Junior Colleges in Singapore. Hence, the implementation of training was carried out in three phases over three years from 1997 to 2000.

From the outset, ETD saw the importance of providing a training programme that was rooted in pedagogy and customised to the Singapore curriculum to ensure that teachers were able to use technology effectively as well as see the relevance of the training to their current teaching practices. ETD ensured that the basic ICT skills teachers learned in the IT POWER21 programme were integrated into pedagogical training so they could use them effectively. For example, ETD incorporated the use of Internet search skills in the context of sourcing for information for subjects like English Language, History and Science, as well as project work. The training sessions conducted were generic, with specific subject-based examples cited for the benefit of teachers teaching different subjects.

The first phase of ICT-based pedagogical training was conducted within each school to develop a sense of ownership and common vision

among the teachers. This school-based approach also encouraged teachers in the same department to support one another in the planning and development of ICT-based lessons.¹

Recruitment of Trainers

As the training of teachers in ICT use was deeply rooted in pedagogy, MOE did not consider it effective to engage commercial vendors to provide training on the integration of ICT into the curriculum for the teachers. Hence, the ICT Training Branch of ETD had to create its own group of trainers to implement ICT training for all teachers. Trained in-service teachers mainly from Primary and Secondary schools who were pedagogically sound and had an aptitude for change and an interest in technology were recruited by the ICT Training Branch as Senior ICT Instructors. Most of those recruited were Heads of Departments, Subject Heads and Level Heads who possessed both subject mastery and management skills.

The first group of Senior ICT Instructors was recruited in late 1996 and deployed to train the 22 Primary and Secondary Demonstration schools in 1997. That year, more Senior ICT Instructors were recruited in preparation for the Phase 2 training of about 100 schools and Phase 3 training of 250 schools. Subsequently, the branch conducted an annual recruitment exercise as part of its renewal process.

Training the Trainers

The Senior ICT Instructors were key trainers and mentors for all schools coming on stream during the phased implementation. Hence, the first tier of training was carried out with 60 Senior ICT Instructors and it was completed in late 1996. Two consultants were engaged to train these key trainers in core areas. The Senior ICT Instructors were also given initial training in a variety of pedagogical approaches to enhance their repertoire of teaching and learning strategies so they could adopt or adapt to technology more effectively. Over the years, experts in areas such as cooperative learning, thinking skills, brain-based learning, constructivist learning and digital portfolios were invited to conduct training workshops for Senior ICT Instructors. In addition, they were given exposure to strategies that supported ICT infusion in the school curriculum,

approaches to adult training and current ICT infused teaching and learning practices.

Most of the training carried out for the Senior ICT Instructors was experiential and on the job and included the development of training materials. As pioneers, the Senior ICT Instructors had to develop these training materials from scratch for which they explored a variety of ICT tools such as mind mapping software and educational CD-ROMs. Besides the training materials, the Senior ICT Instructors used strategies such as cooperative learning and thinking skills which they had acquired during the training sessions they had attended.

Good teamwork was essential as the Senior ICT Instructors had to regularly engage in group discussions to generate training ideas and evaluate training materials in teams. They were also involved in workshop simulation exercises and dry runs together with their teams. All this was done to ensure that the delivery of training and the materials produced were of a high standard.

As the Senior ICT Instructors trained Demo school teachers, they learned through their experience and their collective wisdom led to refinements made to the training materials and approaches. The ICT Training Branch adopted the fan model in the core training of new Senior ICT Instructors. In this approach, experienced Senior ICT Instructors trained and mentored new instructors who later went on to train other new recruits. Just like the first group of Senior ICT Instructors, learning largely took place on the job through their involvement in developing training materials, training teachers and providing support to school leaders in ICT planning and evaluation.

Besides formal training and experiential learning, the Senior ICT Instructors also attended conferences and seminars. They were involved in these events in various capacities such as organisers, presenters and facilitators. In addition, some ICT Instructors were involved in overseas study trips to learn from counterparts in the educational fraternity as well as to share Singapore's experiences in ICT implementation.

Experience was also garnered from several collaborations with the industry and educational organisations such as the National Institute of Education (NIE). For example, Senior ICT Instructors worked collaboratively with ICT companies in the adoption of ICT tools such as the Geographical Information System (GIS), Global Positioning System (GPS) and data loggers.

Teacher Training Programmes in First Masterplan

The ICT Training programme² for teachers in the First Masterplan covered skills and knowledge in the integration of ICT into the curriculum. It was implemented in Primary and Secondary schools in three phases from 1997 to 2000.

Training for the Demonstration schools in 1997 was carried out in a generic one-size-fits-all approach with numerous hands-on activities at the workshops. Annex B provides a list of Demonstration Schools. Teachers, regardless of the subjects they specialised in, were trained in a standard set of ICT pedagogical skills such as using the Internet and Open tools such as MSWord, MSExcel and MSPowerPoint.

Most teachers completed eight to 10 core modules over 30 to 50 training hours. The training aimed to help them integrate ICT effectively into the curriculum. Hence, they were introduced to various types of ICT resources, and learnt to evaluate and select appropriate ICT resources for their teaching. They were also introduced to appropriate teaching and learning strategies, including thinking skills and cooperative learning strategies. Furthermore, in line with the move towards project work, teachers were shown how ICT could be integrated in the various stages of project work. These included using ICT resources to research, organise, analyse and present information.³

The training programme was revised annually to incorporate new technologies as well as to allow for refinement of the training materials and delivery. For example, with feedback from Demo schools, the training for Secondary schools and Junior Colleges was changed from a generic approach to a subject-based one to better meet the needs of teachers. The subject-based approach also allowed for greater depth of coverage for each subject area. Training took various forms such as face-to-face workshops for the core subjects (e.g. Languages, Humanities, Mathematics and Science), sharing sessions for non-core subjects (e.g. Art, Design & Technology, Home Economics, Music) and dialogue sessions for the exchange of ideas and experiences amongst Heads of Departments.

To further assist teachers in their transfer of learning, handholding sessions were provided to all schools as part of the core training. Senior ICT Instructors attached to the schools demonstrated the effective use of ICT in lessons and supported teachers in designing and co-conducting the lessons. These sessions were usually subject based with the trainers

specialising in different subjects working with teachers in their respective departments. At the Primary level, such sessions were more generic as Primary school teachers teach more than one subject in school.

When core training ended in 2000, handholding continued to be one avenue of support offered to schools or clusters. The services available to schools included consultancy for key personnel, coaching and lesson participation, as well as support for special ICT-based projects. To develop a sharing culture within and across schools, Senior ICT Instructors also provided support for schools or clusters in organising sharing sessions, workshops or ICT-in-Education seminars.

At the school level, the schools were generally proactively initiating their own professional development systems to develop their staff in ICT pedagogies. Some schools implemented the Buddy System where they paired ICT savvy teachers, who were relatively new in service, with their less ICT savvy but more pedagogically strong teachers. This system allowed for the teachers to mutually benefit from the partnership. Besides the Buddy System, some schools also appointed a group of teachers who enjoyed learning and experimenting with technologies as ICT champions. These teachers not only experimented with technologies for teaching and learning but also developed lessons to share with other teachers and allowed them to observe their lessons.

The next phase of training offered to schools from 2001 onwards was the elective workshops. This phase focused on helping schools sustain what they had begun and stretch schools and teachers who were ready to explore new technologies and strategies.

The electives were designed to cater to teachers at various stages of ICT use. The sessions were conducted at different times of the year for greater flexibility in terms of scheduling. Teachers and key personnel who were keen to explore and experiment with different ICT resources could apply to attend the electives on a voluntary basis.

The electives supported teachers in using ICT open tools that allowed for infinite customisation and inquiry based learning. The electives also supported teachers in maximising the schools' physical and technological infrastructure for lesson delivery and collaboration, e.g. there were elective workshops on the use of the school network for collaborative learning. Teachers were supported in designing and implementing ICT-based lessons in different learning environments, including

the classroom, the computer laboratory, on the World Wide Web, and in fieldwork.

The Fieldwork in Geography elective module for example, introduced the use of the Geographical Information System (GIS) software, Global Positioning System (GPS) and dataloggers into activities that incorporated the constructivist and problem based learning approaches. For this module, teachers were required to include students in the actual fieldwork component. GPS and data loggers were used to gather data and students used the GIS to display them in tables, graphs or maps.

Teacher Training Programmes in Second Masterplan

In 2002 when MOE launched the second Masterplan for ICT in Education (mp2), it aimed to sustain the momentum achieved from the First Masterplan to bring about a more pervasive and effective integration of ICT into the curriculum for engaged learning to take place.

While the First Masterplan focused on acquisition of basic ICT integration skills, the Second Masterplan sought to change pedagogical practices of classroom teachers so that they would harness ICT for engaged learning. This resulted in a move from a one-size-fits-all development programme for all schools, to a “mass-customisation” approach that catered to specific groups of schools to enable them to integrate ICT based on actual student needs. With this move, ETD had to review its training programmes and introduce new ways of training as well as support for schools. ETD moved towards a “just-enough” professional development approach in addition to its “just-in-time” approach to better meet the needs of teachers and HODs who were at different levels of competencies in integrating ICT into the curriculum. Schools were given the autonomy to decide on the type of professional development programmes required as well as when and who should be involved in the programmes. ETD offered customised programmes which were mostly subject-based on a school or cluster basis to meet their specific needs.

These customised programmes took varied forms including face-to-face workshops, field work as well as attachment programmes focusing either on the baseline use of ICT for teaching and learning such as using the Internet, or higher levels of ICT use such as discussion forums. These programmes allowed teachers to learn actively and

collaboratively in a variety of learning environments. Senior ICT Instructors were renamed Educational Technology Officers and played the role of trainers as well as consultants for cluster schools assigned to them. ETD's ICT consultancy teams worked with schools to build their capacity in ICT planning and use.

ENSURING SUSTAINABILITY

Training of Key School Personnel

Key personnel have played an important role in driving ICT implementation in their schools. As early as the implementation of the First Masterplan, workshops were designed to equip Principals, Vice-Principals, and Heads of Departments (HODs) with strategies for supporting teachers and impacting departments in the use of ICT for teaching and learning. These workshops also served as a platform for the sharing and discussion of good practices.

Key areas covered in these workshops included technology planning where key personnel understood the role of technology in education as well as critical factors for effective implementation. They were also given insights on possible systems and support structures that could help them create a supportive environment for ICT integration. This included learning about the effective management of teaching and learning resources to help support ICT programmes in school, and evaluating their ICT plans.

The professional development programmes for school leaders continued to evolve with the implementation of mp2 as school leaders needed to keep abreast of the rapid advances in ICT and their potential applications in learning. Two avenues available for the professional development of cluster Superintendents and Principals in the area of technology leadership are the Leadership in Education Programme (LEP) and Leader for Leaders Programme (LLP) conducted by NIE.

In the LEP Programme, one of the two technology modules offered is "Strategic information technology integration in schools: Systemic innovation informed by the learning Sciences". In this module, participants engage in conversations on learning for the 21st century and the kinds of

skills, thinking, and dispositions needed for teachers and students. The other module, “Strategic Information Technology Integration in Schools: Learning and Communities of Practice: Implications for School Leaders” attempts to update participants in developments from the perspectives of neurosciences, social-cultural psychology, and situated cognition. In particular, the module provides a theoretical understanding of how learning occurs and explains why Communities of Practice (CoPs) is a viable model for developing learning.

In the LLP programme, the module, “Technology in Learning — Implications for School Leaders”, engages leaders in exploring how technology can be harnessed for active and engaged learning in the classrooms and the role of the leader in providing the vision, direction and support. Besides, Breakfast Forums initiated by IDA and supported by MOE, were conducted in 2006 for the Academy of Principals. The topics planned for the forums included immersive learning using iMAX technology and mobile computing for 1-to-1 learning.

From 2006 onwards, ETD organised a two-day ICT Seminar for Principals and Cluster Superintendents to build their capacity to provide leadership in harnessing ICT for engaged learning. The ICT Seminar was initiated by the Former Permanent Secretary for Education, LG(NS) Lim Chuan Poh (2004–2007). He wanted an experiential seminar that will immerse Principals and Cluster Superintendents into the digital world that their students live and play in so that, through experiencing these hands-on activities, the participants will be fired in their minds to think and explore about new possibilities in the use of ICT in teaching and learning. The participants were presented with ideas on new learning possibilities with ICT, the dangers of game addiction and issues of cyber safety. Hands-on activities were designed to allow the participants to play the online games that were popular with their students and to experience the use of Web 2.0 technologies such as Wikis, Blogs, Instant messaging and Second Life. The ICT seminar was aimed to inspire them to carry out new ICT plans in their schools.

Participants used ICT tools to prepare and facilitate their note-taking, discussions and presentations, and to create simple learning objects. Other selected ICT tools and equipment used at the ICT Seminar included interactive whiteboards, classroom performance systems and digital video cameras. Facilitators at the camp also modelled the use of

ICT to engage and interact with participants as the main emphasis was to help the participants experience ICT-based pedagogies in a learner-centred environment, rather than the learning of technical ICT skills.

One of the participants, Lo Sheu Ming, Principal of Regent Secondary School (2006–present), who attended the first ICT seminar remarked, “A very interactive platform which can stimulate thoughts and ideas.”

In the Diploma in Departmental Management programme (DDM) (replaced by the Management and Leadership in School Programme in 2007 (MLS)) for HODs, NIE collaborated with ETD to introduce a variety of technologies such as blogging and interactive digital media resources. They also engaged HODs in exploring possibilities for the use of these technologies for teaching and learning. In addition, an elective module on technology planning was offered to participants.

To reach out to more HODs, work attachments at ETD were also made available to HODs who wanted to gain insights on issues of ICT planning, ICT integration and professional development, and were keen to apply this knowledge to drive ICT-related programmes in their schools. During the attachment, they would explore various ICT tools and pedagogies to engage students. At the same time, they would learn about factors for effective ICT integration and the possibilities of ICT integration in the various curricular areas in schools. They would also be involved in developing or refining their school’s Department Plans for ICT integration in Instructional Programmes and in the development of ICT resources as well as lessons for teaching and learning.

Pre-Service Teacher Training

Within two years of the launch of the First Masterplan in 1997, NIE had aligned its teacher training programmes to ensure that all graduating students had core skills in teaching with ICT resources. This required the effective infusion of ICT into NIE’s own curricula, the training of all academic staff so that they became role models in the use of ICT, and the provision of access to ICT tools and related resources for all trainee teachers. The first priority was to equip graduates from the 1997/1998 academic year with the basic skills required to integrate ICT into the teaching of school curricula subjects. NIE also

introduced a scheme to encourage trainee teachers to purchase their own computers.

All trainees were required to go through a compulsory Instructional Technology course that taught how ICT could be integrated into teaching and learning. This was the foundation course. Approximately 70% of students opted to take an advanced elective module that built on the foundation course. The use of ICT in teaching and learning was also covered in Curriculum Studies courses, such as the “Teaching of Physics”. In the period of 1998–2001, the Instructional Technology course intended to achieve three goals. At the completion of the course, pre-service teachers were expected to be able to (1) identify and evaluate existing ICT resources for instruction; (2) adapt and integrate ICT resources into instruction; and (3) design and create ICT-based materials. To achieve the first and second objectives, a computer-based lesson was introduced. Prospective teachers were introduced to the methods of evaluating educational CD-ROMs and web-based resources, and were helped to prepare a lesson into which the reviewed resource was integrated. Prospective teachers were also exposed to various types of school curriculum related resources developed by the Ministry of Education and private publishers. The computer-based lesson normally took about three weeks and accounted for about 30% of the course assessment.

To reach the third objective, i.e. to design and create ICT-based materials, prospective teachers learned to use Microsoft PowerPoint, a simple authoring tool, to produce a learning package called microLESSONS. As the name implied, microLESSONS were small units of activities with specific learning objectives. The conception of microLESSONS evolved in the late 1990s from a collective effort by NIE faculty members in preparing pre-service teachers to use ICT in the classroom. Instructional design approaches to microLESSONS progressed from teacher-centred direct instruction in the initial years to more learner-centred activities, which could range from simple drill/practice and tutorials to more constructivist oriented learning activities. Trainee teachers were encouraged to explore alternative instructional approaches in the design of microLESSONS, such as inquiry based learning and problem-based learning. In the period of 1999–2001, about 4,000 prospective teachers successfully completed the Instructional Technology course and produced microLESSONS.⁴

Professional Sharing

Recognising the importance of professional sharing in helping build a strong ICT culture, MOE created platforms to allow teachers and key personnel to share in activities at the cluster, zonal and national levels. In the First Masterplan, the ICT in Education Seminars organised by ETD allowed teachers to share ICT based lessons at the national level. Teachers shared their lesson materials and experience in carrying out ICT based lessons at the seminar. Eventually, these seminars were organised by schools, namely the Demonstration schools, supported by ETD.

In April 1998, the Demonstration Schools, in collaboration with ETD, organised an Open House featuring teachers and students using ICT. Senior ICT Instructors guided the schools in the conceptualisation and planning of this sharing. One of the main objectives of the Open House was to showcase what Demonstration Schools had achieved in their ICT-based programmes in terms of infrastructural procurements and curriculum integration. The exhibition was open to Phase 2 schools, parents and members of the public.

From 1998 to 2000, the ICT in Education Seminar (ITES) was organised to provide opportunities for educators to share evolving and creative use of new technologies in classrooms, learn from one another, promote collaboration, as well as create a self-sustaining mechanism for future seminars. The main objective of the event was to promote schools' initiatives and expand schools' role in developing an ICT culture, as well as to promote a learning and sharing culture in classroom practices and expertise within and between schools.

In 1999, sharing platforms started evolving from just face-to-face sessions to ones that incorporated online sharing of resources. One such platform was the Science Teachers' NeST where Science teachers who attended sharing sessions organised by ETD were required to upload lesson resources, and encouraged to continue sharing resources with fellow participants. NeST functioned as a repository of these lesson resources and was made available on the MOE Intranet.

By 2003, NeST had evolved into a learning community which provided a place for Secondary School Science Teachers to virtually meet, get ideas for lessons, share their own lesson ideas, discuss these ideas and

keep abreast with what other Science teachers were doing in the use of technology for teaching and learning. The NeST learning community also extended beyond the virtual environment with a once-a-semester, face-to-face informal gathering for its members.

In mp2, a number of other schools initiated their own seminars and sharing sessions mostly at the cluster and zonal levels, with a couple of schools organising ICT Seminars at the national level. To better meet the needs of teachers who were interested in experimenting with cutting edge technologies, ETD created a special interest group called “TecXplorers”. This group comprised teachers from different schools in Singapore who were teaching different levels of students. ETD organised group gatherings several times each year for its members to learn about new technologies, discuss their potential for teaching and learning as well as share their own experiences of using new technologies.

By 2007, a number of school clusters had created their own online portal for sharing ICT based teaching and learning resources among their member schools. This has expanded into such portals at the zonal level where more schools within a zone are able to share resources with one another.

ACHIEVEMENTS

Increasing Capacity of Schools

The First Masterplan for ICT in Education had effectively laid a foundation which enabled schools to integrate ICT into the curriculum and cultivate an ICT culture amongst staff and students. One of its major achievements included enabling all teachers to acquire the core competencies in integrating ICT into the curriculum. This in turn resulted in teachers accepting ICT as a pedagogical tool in the classroom. On top of that, there were pockets of excellence in the use of ICT in learning among some teachers and schools which provided models and directions for further innovations in the use of ICT in teaching and learning. School leaders have also increasingly shown their capability in effectively planning and implementing school-wide integration of ICT as exemplified by the annual school ICT plans which generally show a greater number of ICT programmes integrated into the schools’ curriculum.

In mp2, MOE's just-in-time and just-enough approach in working with schools provided the necessary conditions for classroom teachers to innovate with ICT in the curriculum. There is a sustainable mechanism and framework for sharing innovative pedagogical practices and models as well as teacher created resources among schools and teachers. There are a growing number of online portals for professional sharing initiated by school clusters and zones as well as formal sharing sessions, seminars and learning festivals organised by school clusters and zones for their teachers.

Increasing Capacity of Teachers

Towards the end of the First Masterplan, a number of innovative practices in the use of ICT emerged from classroom teachers. The entries from teachers to the various recognition platforms also showed a significant improvement in terms of the quality of ideas and innovative use of ICT. In 2006 for example, Nur Ilyana Bte Mohamed Anwar (CHIJ — Lady of Our Nativity), one of two Distinction Awardees, went on to win the highest coveted honour, the 2006 Microsoft Educators Choice Award at the Worldwide Innovative Teacher's Forum (WIFT) in Philadelphia, USA, for innovative use of Microsoft PowerPoint to teach her Primary school students how to draw. WIFT provided opportunities for winners like Nur Ilyana, who were passionate about teaching and learning, to exchange ideas and share their experiences with one another.

LEARNING POINTS

Addressing Different Levels of ICT Competencies

One of the many obstacles ETD had to overcome when introducing ICT in schools was changing the mindset of reluctant teachers. Initially, they did not see the necessity of using ICT in the classroom as students were doing well academically even without it. The time needed to source for resources to develop ICT-based lessons was another factor that some teachers cited as a challenge. To overcome this, MOE had to ensure that all teachers received core training in integrating ICT into the curriculum,

and that the training had to demonstrate to teachers exactly how ICT lessons could be conducted in the context of classroom teaching.

Complicating the issue were the teachers' varying levels of ICT competency both for teaching as well as for administrative purposes. The teacher training programmes therefore, had to be designed to meet the differing needs of these groups of teachers. Faced with these challenges, MOE's decision to focus on teacher development in addition to hardware provision, proved to be strategic. The implementation of the core training was phased to give schools the flexibility to decide their pace of implementation according to their level of readiness. At formal training sessions, teachers could view demonstrations conducted by the Senior ICT Instructors as well as be engaged in hands-on activities to learn experientially. Additional support to teachers was given in the form of handholding in lesson design and co-teaching of ICT based lessons by the trainers.

At the school level, school leaders played an active role in continuously encouraging teachers to integrate ICT into their lessons. They assessed the needs of their teachers and ensured that they received adequate additional training or other forms of support such as through a Buddy System for teachers who were not comfortable with the use of ICT. School leaders also ensured that adequate resources, both hardware and software, were acquired and made accessible to teachers.

ICT Culture Building

In addition to providing teachers with training so that they would acquire essential ICT skills, MOE saw a need to create an ICT culture among teachers. Building an ICT culture in MOE and the schools was considered crucial in sustaining the integration effort and ensuring that the culture of innovating with ICT would thrive.

At the initial stage of the Masterplan, a Computer Purchase Scheme for Teachers (CPST) was introduced to provide incentives for teachers to purchase their own computers. MOE co-paid 20% of the purchase price for desktop computers and 40% for notebook computers. Many teachers rode on the scheme to purchase their own desktop computers and notebooks to facilitate their administrative work as well as to familiarise themselves with ICT tools for teaching.

In 1999, to recognise individual teachers who used ICT creatively and to motivate them to higher levels of ICT use, MOE introduced the Hewlett Packard Innovation in Information Technology Award, also known as HP INIT Award. This award was sponsored by Hewlett-Packard (Singapore) in keeping with MOE's desire to involve the private sector in education initiatives and HP's worldwide citizenship objective to be an intellectual asset in the countries in which it operated. A total of 142 applicants applied for the award in 1999. In 2001, to encourage collaboration and networking amongst teachers and specialists, a new dimension was added to the award which required teachers to reflect on their own learning experiences through the innovative use of ICT. Team awards replaced individual awards and teachers were encouraged to collaborate with others within the school as well as with teachers and other educators externally.⁵

From 2002 to 2005, the HP INIT2 Award aimed to promote the sustainability and spread of innovative efforts to bridge the digital divide in instructional practice among teachers. Teams submitting entries for the HP INIT Award 2004 could include an INIT2 Plan to extend their innovative practice to more teachers through sharing, handholding and consultancy services. The competition, which involved teamwork and tapping on expertise from external organisations, was introduced to encourage collaboration and richer innovation. The competition resulted in the involvement of 29 organisations and overseas schools through collaborations with local schools. The organisations included institutes of higher learning and the National Cancer Centre.

In 2004, with sponsorship from Microsoft Corporation, MOE introduced the Microsoft-MOE Professional Development Award to reward and recognise teachers who made outstanding, effective and innovative use of ICT to support engaged learning. It also recognised teachers who used ICT for the benefit of the school community, and inspired and encouraged others in their use of ICT in teaching and learning. The recipients of the Distinction Award received a sponsorship to attend and compete at the Microsoft Worldwide Innovative Teachers' Forum. The Merit Awardees were rewarded with a sponsorship to attend and compete at the Asia Pacific Innovative Teachers' Conference. Another award, the Lenovo Innovation Awards, was introduced in 2007.

Giving teachers recognition and a platform for sharing their ideas has served to motivate an increasing number of them over the years to be creative and innovative in their use of ICT. This has generated a positive effect in schools and across schools where many systems have been put in place to encourage teachers to work in learning teams to share ideas and carry out research based activities.

ENDNOTES

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