Component 7

Professional Development
Overview

The teacher has an important role to play in the teaching/learning paradigm shift, with ICT facilitating the development of a higher level of cognitive skills in evaluating arguments, analyzing problems and applying what is learnt. The teacher no longer monopolizes activities as the transmitter of subject matter since emphasis has shifted from lecture-oriented teaching and learning activities, to activities that are governed more by the learning needs of individual students, including more situation-specific ad-hoc instruction, small group instruction, and one-to-one tutoring.

While teachers play a pivotal role in the learning environment, they are oftentimes not consulted concerning changes to teaching-learning procedures. The teachers’ needs under changing conditions have to be continuously assessed and activities to satisfy these have to be developed. Very often, teachers’ training programmes focus more on basic literacy skills and less on the integrated use of ICT in teaching.

Teachers are more likely to integrate ICT in their courses, when professional training in the use of ICT provides them time to practice with the technology and to learn, share and collaborate with colleagues. Perkins (1993) argues that the best use of any physical support system, including ICT, is an art; and it is necessary to acquaint the teachers with this art. This component examines professional development in the use of ICT to address the design of the learning environment, taking into account opportunities and limitations. The following issues are discussed: (i) policy and management of teacher training on ICT, (ii) teacher training modalities, (iii) teacher competencies and standards, (iv) mindset change of teachers, (v) content focus of capacity building for teachers, (vi) capacity building of all education personnel, and (vii) incentive system and motivational strategies for teachers.
Lessons learned

Based on the case studies, the following lessons learned have been identified with regard to six issues:

1. **Policy and Management of Teacher Training on ICT**
   - To ensure continuous training of teachers from pre-service teacher education to induction to in-service professional development, other training agencies should be mobilized and labour divided among them, with the MOE providing central coordination.
   - Professional development is more likely to succeed if continuous training of teachers is a built-in process and is offered as a benefit to them.
   - A centralized training administration system for all teaching and non-teaching staff is crucial to document and monitor professional development.

2. **Teacher Training Modalities**
   - Peer and school-based training of teachers by their more experienced peers from other schools or senior instructors from the MOE ensures that teachers are trained in the context of their workplace.
   - Incorporating online learning into professional development on ICT enriches the teachers’ experience and makes them comfortable with online learning.
   - Needs-based just-in-time learning and peer coaching ensure further development of the teachers’ ICT and pedagogical skills.

3. **Teacher Competencies and Standards**
   - ICT competency standards serve as a benchmark for formulating and evaluating teacher training programmes and use of ICT in teaching.
   - Customizing national-level ICT competency standards for each school, depending on its socio-cultural context, ensure ICT integration and acceptance.

4. **Mindset Change of Teachers**
   - A buddy system approach where novice teachers work together with expert teachers in a classroom using ICT contributes towards changing prevailing mindsets.

5. **Content Focus of Capacity Building for Teachers**
   - Training teachers on ICT-related skills within the context of classroom objectives and activities ensures development of skills in the integrated use of ICT in teaching.
   - ICT professional development programme for teachers should be planned, taking into account the vision of ICT in education policy.

6. **Capacity Building for All Education Personnel**
   - Training education personnel at all levels ensures that all aspects of ICT use in schools are implemented in an efficient, coherent and complementary way.

7. **Incentive System and Motivational Strategies for Teachers**
   - Having a recognition system for innovative and effective use of ICT integration in schools will motivate teachers to use ICT in teaching.
   - Formal certification of in-service professional development that leads to diplomas or degrees could provide an incentive for teachers to upgrade and update their skills in and knowledge of ICT integration.
   - Teachers’ interest in using ICT after their training is more likely to grow if they are provided with computers, training materials and software for classroom use.
To ensure continuous training of teachers from pre-service teacher education to induction to in-service professional development, training agencies should be mobilized and labour divided among them, with the MOE providing central coordination.

It is not possible for the MOE and teacher education institutions to address all the ICT training needs of teachers. There is a need to sub-contract certain courses to private training agencies and institutes of higher learning. However, the MOE and the respective schools must work very closely with these training entities to design a training curriculum that is relevant to the needs of the teachers. The curriculum should focus on both the pedagogical and technological aspects of ICT integration.

a. Indonesia: A number of teacher training institutions have introduced compulsory courses concerning computer use and the Internet. Teachers graduating from these institutions are expected to be able to use computers and the Internet in their teaching activities. Different computer literacy in-service training for teachers have also been conducted as an initiative by individual schools or by the MOE.

b. Philippines: Most teacher training institutions have incorporated computer courses into their curriculum as a requirement for graduation. However, computer literacy is not yet a strict requirement for teacher certification. In general, there is a need to reform the pre-service teacher education system. For this to happen, teacher education institutions need to upgrade their facilities and faculty skills as well as to restructure their curriculum. The Intel Teach to the Future Programme and the Commission on Higher Education are currently discussing a programme for improving knowledge and skills in the use of ICT for teaching and learning, at the pre-service level.

In-service training opportunities for public school teachers, on the other hand, are being provided by various entities. DepEd’s computerization programmes include a basic computing and Internet literacy-training component. The Intel Teach to the Future Programme also provides basic skills and technology integration training for public secondary school teachers. It has reached around 35,000 teachers via a cascade or echo scheme since it began in 2001. SEI-DOST, with its various partners, provides more specialized training to Science and Mathematics teachers, specifically in robotics, ICT application in Physics teaching, use of graphic calculators for Math and Calculus, electronics, and computer assembly. In the private basic education sector, commercial providers typically conduct in-service training (Department of Education, 2002).

In-service teacher training must also be given higher priority, particularly beyond basic skills training. A long-term, flexible, and teacher-
Integrating ICTs into Education

For prospective teachers, ICT training is carried out by the departments of computer science and through relevant subjects in universities of education and teachers’ colleges. Computer education provided by the departments of computer science tends to focus on computer literacy. Students enrolled in a university of education obtain six credits for general courses related to computer literacy and 20 credits for advanced courses that they select. Computer courses provided by other departments stress the use of computers, especially the improvement of teaching-learning methods using computers.

In-service training consists of training for additional qualifications and professional job training. Training for qualifications is provided to secondary school teachers who teach computer science as part of their first-class or second-class teacher training qualifications and for teachers who apply for principal or vice-principal qualifications. From January 1, to December 31, 2001, 914 teachers, 213 middle school teachers and 701 high school teachers received computer qualifications.

Professional job training on ICT use dates back to 1972 when teachers received mandatory training at Doksu Vocational High School. Training was carried out through a connection between the high school computer and the mainframe computer at the Korea Institute of Science and Technology (KIST). The programme expanded as more computers were distributed to schools and teachers in 1984. It received increased emphasis especially after 1988 when personal computers (XT level) were distributed to every school. More than 730,000 teachers received professional job training in ICT use from 1998 to 2001.

e. Thailand: The ICT master plan incorporates professional development programmes for teachers, administrators, and education personnel to support the use of ICT in their work. The MOE has delegated an ICT sub-committee to develop and design standard training programmes for these groups of personnel and to guide responsible departments within the Ministry on the provision of training. The training courses will be customized for school administrators, ICT teachers, non-ICT teachers directed in-service programme must be designed and the necessary investments made. To ensure retention of skills, teachers must also be provided with sufficient access to ICT facilities post-training. Both the Intel Teach to the Future Programme and the Pilipinas SchoolNet are currently providing advanced ICT-based training, but these and other programmes need to be rationalized within an overarching framework for in-service training.

c. Singapore: The ICT master plan encourages the involvement of ‘academic coaches’ from institutes of higher learning, ICT firms that have association with and expertise in education, and committed ICT professionals from the private and public sectors. Different approaches to ICT use provide a rich source of learning to both ‘academic coaches’ and stakeholders of the schools.

The NIE offers ICT training programmes and ICT has been integrated in the NIE curricula. The first priority has been to equip trainee teachers from the 1997/98 academic year with basic pedagogical and technical skills on ICT integration. ICT skill (e.g. PowerPoint, DreamWeaver, Excel) workshops were conducted on Saturdays by private ICT training consultants.

An induction programme is provided to supplement the NIE’s basic training. The MOE’s centralised induction programme, conducted by the Teachers’ Network for New Teachers, provides vital information, survival tips, platforms for discussion and sharing among beginning teachers, and between beginning teachers and more experienced ones in face-to-face and electronic environments. This applies to both ICT- and non-ICT-based tasks carried out by teachers. Individual schools have their own induction training. New teachers are assigned to a personal mentor in their schools to guide them.

The transition from initial teacher education to induction, and from induction to continuous in-service professional development and networking is becoming seamless.

d. South Korea: Training in ICT use is provided as training for prospective teachers and as in-service training for teachers. ICT training for prospective teachers is carried out by the departments of computer science and through relevant subjects in universities of education and teachers’ colleges. Computer education provided by the departments of computer science tends to focus on computer literacy. Students enrolled in a university of education obtain six credits for general courses related to computer literacy and 20 credits for advanced courses that they select. Computer courses provided by other departments stress the use of computers, especially the improvement of teaching-learning methods using computers.
and school technology coordinators, based on both pedagogical and technological perspectives.

Recent cooperation between Thailand and Australia under the Capacity Building Facility for Thai Education Reform (CABTER) includes a pilot project for developing school-based ICT training centres using the Navigator School Model. Twenty-four primary and secondary schools have been selected as pilot schools for the design of practicum-based professional development programmes and trial for all staff, to support school and classroom-based practices in ICT use. To date, there is no linkage between pre-service and in-service professional development programmes.

Oracle’s Think.com and Intel Teach to the Future Programmes have also focused on capacity building for teachers. While Think.com has emphasized utilization of its website both inside and outside the classrooms, Intel Teach to the Future Programme encourage teachers to address students’ high order thinking skill in the integration of ICT in classroom activities. Moreover, the ITEd project funded by JICA aims to produce six WBT materials for six courses. Up to 3,000 teachers will be involved in three type of training courses: information literacy, information delivery, and information system management.

Professional development is more likely to succeed if continuous training of teachers is a built-in process and is offered as a benefit to them.

a. **South Korea**: Between 1997 and 2000 all teachers had an opportunity to participate in the annual professional training programme. Beginning in 2001, one-third of all teachers had attended the annual professional plan job training, under the Promotion Plan for ICT Utilization in School Education, prepared by the Ministry of Education and Human Resources Development. Every teacher receives professional job training once every three years.

b. **Singapore**: Teachers are entitled to 100 hours of in-service professional development each year. Teachers are also fully sponsored or highly subsidised for courses that are conducted by private training agencies. According to a survey by Soh (2002), all teachers have received 30 to 50 hours of ICT-related professional development. The majority (84%) have expressed their interest in further ICT training above the required minimum. 77% of the teachers are looking for other ways to integrate ICT in education. 68% feel that ICT has encouraged class participation. 65% have found the preparation for ICT-based lessons worthwhile. Given such positive perceptions of the teachers, the professional development programme seems to have been successful.
The system must be accessible to all staff via the Intranet or Internet so that they can track and monitor their own professional development, and plan and apply for courses that they need to attend. The system will help supervisors to monitor the professional development of staff, while also enabling the staff to plan their own professional development.

a. **Singapore**: In order to document and monitor the professional development of education personnel under the MOE, the Training Administration System (TRAISI) was developed in 1999. It was designed and developed by Andersen Consulting in association with MOE’s Staff Training Branch. TRAISI is an online system on the Intranet that enables both teaching and non-teaching MOE staff to document their individual training roadmaps. It allows staff to search online for training courses at the MOE and the Institute of Public Administration and Management (IPAM) and to apply for admission. The system then informs the staff of the outcome of their application via fax or e-mail depending on their preference. TRAISI also helps to track training status and generate training statistics.

---

**Issue 2**

**Teacher Training Modalities**

---

**Peer and school-based training of teachers by their more experienced peers from other schools or senior MOE instructors ensures that teachers are trained in the context of their workplace**

a. **Singapore**: An effective and continuous programme for training teachers in the use of ICT was central to the success of MP1. All teachers were trained to handle IT-based instruction and to support new learning strategies. A four tier-fan training model was put in place in every school in 1999. 60 senior ICT instructors from the ETD formed the first tier of training that was completed in late 1996. The senior ICT instructors then trained 22 demonstration schools in Phase 1 of implementation. In Phase 2, heads of departments in charge of ICT and selected teachers from each Phase 1 school co-trained teachers from three to four schools each, together with senior ICT instructors. In turn, selected heads of departments and teachers from these schools trained those in the final phase of implementation. The fan approach generated a multiplier effect, enabling the sharing of expertise and experiences among schools. The heads of departments and teachers from the earlier phases, who were selected as part-time instructors for other schools, had their teaching duties reduced by about one-third. Senior ICT instructors played the role of key trainers, mentors and coordinators for all schools during the phased implementation.
Incorporating online learning into professional development on ICT enriches the teachers’ experience and makes them comfortable with online learning.

This type of training may include face-to-face tutorials with independent online learning. This allows teachers to experience different modes and strategies of instruction, especially online ones.

a. Singapore: The core module on ICT integration in the pre-service education programme focuses on the pedagogies of using ICT in the classrooms. Tutors employ a fully dynamic online learning environment to complement onsite activities. In 2002, the module had four major components: anywhere/anytime lecture, onsite laboratory tutorial, online independent hands-on session, and online asynchronous discussion. There was a shift in the mode of assessment from summative to more formative, and in the orientation of delivery from cognitivist to social-constructivist. (Lim, 2001a). The anywhere/anytime lectures were designed to complement textbook readings. The tutors co-authored a book ‘Teaching and Learning with Technology’ (Tan & Wong, 2003) to highlight and address key issues of ICT integration. The online lectures consisted of instructional objectives, dynamic guiding questions and reflective activities (such as, online quizzes and hyperlinks to case studies) to enhance task-orientation and encourage critical reflection among trainee teachers.

During onsite laboratory tutorials, there was no didactic teaching and less discussion of textbook concepts (these discussions were carried out through the online discussion board). Instead, the tutorials focused on collaborative activities among groups of trainee teachers working together on tasks. The tasks were always posted on the module website two weeks before each tutorial session. To encourage greater learner autonomy, there were independent online sessions that required trainees to work independently on challenging tasks. These included identifying learning opportunities and problems associated with the use of IT tools within the school context, critiquing visual aids posted by their fellow trainees or tutors, and reflecting and commenting on video clips of classroom management issues. They were asked to work with their partners and classmates, bounce off ideas and explore ICT resources.

Trainee teachers were expected to participate in intra- and inter-group online discussions. The online discussions allowed them to apply what they have learnt to their own learning and teaching experiences and to share their experiences and expertise in ICT integration in schools.

Needs-based just-in-time learning and peer coaching ensure further development of teachers’ ICT and pedagogical skills.

a. Singapore: At Serangoon Garden South School, (http://schools.moe.edu.sg/sgss), a needs training programme caters to teachers’ further development of ICT and pedagogical skills.

Teachers who want to know more about using any hardware or software in the school are requested to submit a needs training form to the head of the ICT department. An appointment is
set up between the trainer (head of the ICT department or ICT committee member) and the teacher. In this way, more personalized attention and time are devoted to the teacher. Peer coaching has been very effective as it focuses on the pedagogical and technological learning of teachers.

### Issue 3

**Teachers’ Competencies and Standards**

**lesson learned 1**

ICT competency standards serve as a benchmark for formulating and evaluating teacher training programmes and use of ICT in teaching

ICT extends learning beyond formal classroom settings and encourages lifelong learning. There is a need to set ICT competency standards for teachers and students. The standards should cover both technical and pedagogical ICT competencies that are tailored to the needs of each school. The standards should avoid software- or product-specific skills and should instead focus on generic skills of particular applications.

*Thailand:* The National ICT in Education Master Plan states the following vision: “Teachers should have a high level of ICT knowledge and skills including an understanding of the development of learning and teaching media for instruction.” This implies the need to develop a set of technology standards for teachers to serve as a benchmark for formulating and evaluating teacher training programmes.

As for science and mathematics teachers, the IPST has developed a set of teaching standards that includes communications skills to promote student learning through an inquiry process. Teachers are required to use technologies as a communications, research and productivity tools, in addition to verbal or written communication skills. This set of technology standards for Thai teachers is developed based on ISTE standards and existing learning standards for Thai students.

**lesson learned 2**

Customizing national-level ICT competency standards for each school, depending on its socio-cultural context, ensures ICT integration and acceptance

Setting ICT competency standards helps to ensure effective integration of ICT in schools. Nevertheless, these standards should not pose additional pressure on students and teachers.

*Thailand:* According to some teachers, it is difficult to measure the level of ICT competency in the production of teaching and learning materials because of constraints in existing ICT infrastructure.
The existing mindset of teachers could prevent them from experimenting with approaches that are contrary to prevailing wisdom. It is therefore necessary to address current ways of doing things. However, the issue is not about replacing lectures or teachers with ICT packages, or about promoting ICT simulation as the best way to relate theories to the real world. If a non-ICT tool can address a learning need or objective successfully, it makes little sense to replace the non-ICT tool with an ICT tool.

**Lesson Learned 1**

A buddy system approach where novice teachers work together with expert teachers in a classroom using ICT helps to change the mindset of teachers.

**Issue 4**

*How to Change Mindset of Teachers*

**a. Thailand:** An effective way to develop positive attitudes towards the use of ICT is a buddy system approach, whereby junior and senior teachers work together on classroom projects using ICT. The positive attitude is reinforced by the satisfaction of seeing the students' improvements and achievements. When the teachers’ mindsets change, their behaviours also change. The IPST uses this approach in in-service training for teachers in the use of specific programmes in science and mathematics.

**Issue 5**

*Content Focus of Capacity Building for Teachers*

**Lesson Learned 1**

Training teachers on ICT-related skills within the context of classroom objectives and activities ensures development of skills in the integrated use of ICT in teaching.

**This approach will ensure that the focus is on applying ICT skills to achieve pedagogical objectives, rather than on teaching ICT skills in isolation. One way of implementing this is by mobilising private or public ICT training agencies to equip trainee teachers with basic ICT skills, while teacher education institutions can focus on the pedagogical use of ICT for education. Private and commercial ICT training agencies are specialists in basic ICT training and may be more competent and effective for this type of ICT training. This will also allow the MOE to focus on the pedagogical aspects of ICT use. Teacher education institutions can work closely with these agencies to develop the curriculum, leaving the training to the latter.**

**a. South Korea:** The plan for training in ICT use was undertaken in 2002, outlining teaching-learning goals in 10 common basic subjects in the Seventh school curriculum. Under this plan, a
Integrating ICTs into Education

A teaching-learning model for ICT use in a teaching-learning plan for each subject was developed, in accordance with subjects in the curricula and the high-tech learning environment in the classrooms, group study rooms and individual multimedia study rooms. The plan has been in progress for two years, from 2002 to 2003, and has been applied to training in ICT use for teachers.

b. Thailand: The MOE and the ICT Unit in the Office of the Permanent Secretary of Education provides in-service teacher training courses at three levels: foundation, intermediate, and advance. The foundation level is a requirement for all teachers. It includes basic, general purpose software, such as word processing, databases, spreadsheets, and Internet use. The intermediate level courses, which are optional for teachers, focus on developing teaching materials that require higher levels of ICT knowledge skills. Examples include developing web materials using presentation programmes, web authoring tools, ready-made templates, and writing simple CAI programmes using authoring software. The advanced level courses are designed for teachers who seek specialization in ICT areas or who teach computer courses and/or work as technology coordinators in their own schools.

However, none of these courses is specific to any subject specialization. Many teachers are not able to apply what they have learned to their classroom teaching and learning. They are also constrained by their heavy workload and rigid class schedule. In addition, some schools do not have the budget to provide supportive environments for integrated use of technology.

There have been developments in the past three years to make the courses more subject-specific.

IPST plays a key role in providing ICT training and train-the-trainer activities for science and mathematics teachers. Handheld devices, such as graphic calculators, probes and data loggers and special software are being introduced in science and mathematics classrooms of pilot schools by first training the teachers.

c. Singapore: The foundation course focuses on hands-on ICT experience at the initial stage of pre-service teacher training and acquaints trainee teachers with the art of integrating ICT in schools. This course is supported by basic ICT skills training workshops that have been sub-contracted to private training agencies. The agencies conduct workshops during the term breaks and on Saturdays, using Powerpoint, Dreamweaver, Flash, Excel, Authorware, and other ICT applications. As elective courses, more advanced ICT-based pedagogical principles and skills are offered. Examples include “Constructivist Learning with the Internet” and “Instructional Multimedia Design”.

An ICT component is integrated in all subject areas, such as Mathematics, Science, English, and Humanities. In all these courses, students have opportunities to design and develop ICT-based instructional plans and resources and share their ideas and products with their peers. Moreover, the trainee-teachers’ practicum gives an opportunity to collaborate with schools to upgrade the trainee teachers’ ICT-integrating skills. During the practicum, trainee teachers are encouraged to design ICT-based lessons and implement them under the close supervision of expert teachers and NIE lecturers.
Various agencies involved in professional development programmes should work in close consultation. These agencies may include the MOE, teacher education institutions and private companies.

a. Singapore: The NIE and ETD work very closely with schools to design the ICT component in pre-service teacher education programmes. They examine the vision, dimensions and strategies of MP1 and MP2 before developing ICT training plans for pre-service teachers. Four types of ICT courses for NIE trainee teachers are offered in the pre-service teacher education programme: basic skill ICT workshops, 30-hour ICT foundation course, 26-hour elective courses, and 6-12 hours of ICT integration in each curriculum subject class.

Experience has shown that most professional development programmes cater only to teachers and heads or principals of schools. However, this should not be the case. MOE’s non-teaching staff, for example, complement and support teachers in the integration of ICT in their schools.

b. Malaysia: The ETD is finalizing a five-year training and professional development plan which takes into account all the personnel involved in the roll-out of the Smart School, namely, ETD officers, state level officers including those from the State Education Departments and the State Educational Resource Centres, and school support staff, such as clerks and technicians.

b. Philippines: Continuing training for policymakers and school administrators in technology planning and management is essential. Many ICT-based programmes have been stalled because of tentative leadership. DepEd has begun to see the need for this and in 2003 brought together, through a series of meetings the administrators of schools that received computer donations through the “PCs for Public Schools” programme. Whether this represents the first step in establishing a long-term professional development programme for administrators remains to be seen.

The schools’ capacity for autonomous technical maintenance must also be developed. The inherent complexity of ICT equipment and tools brings much pressure on school
Integrating ICTs into Education

personnel to operate and maintain ICT facilities efficiently. Hardware, software and network installation and maintenance, system administration, and network security are basic skills that must be available at or near the school. Various NGOs and technical training institutes provide technical support training and assistance to public high schools, but again these programmes must be rationalized and institutionalized at all levels of DepEd.

c. **Thailand**: It is the MOE’s policy that all education personnel should use ICT in their work and that all mid-level personnel should acquire basic skills in using general office software applications and the Internet and e-mail. The Office of the MOE Secretary General organizes training courses for all departmental personnel in a wide range of ICT uses. Training courses for high-level officials are organized by NECTEC and the MICT. In addition, the demand for data and information exchange between departments and ministries in electronic format, as well as on-line communication driven by the Prime Minister Operations Centre, necessitates extensive training to be undertaken by all department personnel.

---

**Issue 7**

**Incentive System and Motivational Strategies for Teachers**

The scheme may be in the form of awards or grants for teachers, heads of departments or principals. It may be at the school level, cluster level or national level. The sponsors could be schools and higher education institutions, or private companies and organizations that work closely with the MOE.

a. **Malaysia**: Other than those teachers who taught the four subjects included in the Smart School Pilot Project, the rest of the teachers in the project’s pilot schools were generally not motivated to improve their ICT skills. However, since the Government implemented the new civil service scheme in 2001, encouraging and rewarding civil servants who acquire competencies in specific areas, there has been greater motivation on the part of teachers to acquire ICT skills and knowledge.

b. **Singapore**: Hewlett-Packard (Singapore) has sponsored the HP INIT Award since 1999 to recognize teachers’ creative use of ICT in teaching. This award encourages teacher to innovate in applying ICT to enhance learning and motivates them to move to higher levels of ICT use. In 2001, a new dimension was added – collaboration and networking among teachers and specialists. The new dimension provides teachers with a platform to reflect on their own learning experiences through the innovative use of ICT, backed by strong pedagogical considerations.

c. **Thailand**: National awards for outstanding teachers are a good strategy to encourage teachers’ dedication. Support and recognition within and outside schools help to sustain their perseverance and enthusiasm. However, other incentives related to the merit system of promotion could be more sustainable in the

---

**Having a recognition system for innovative and effective use of ICT integration in schools will motivate teachers to use ICT in teaching**
Formal certification of in-service professional development that leads to diplomas or degrees could provide an incentive for teachers to upgrade their skills in and knowledge of ICT integration.

**Lesson Learned 2**

*Malaysia:* The Smart School Development Team is experimenting with the “International Computer Driving License”, which offers competency certification at the end of the course. The goal is to determine whether certification would motivate the teachers to sign up for training and to use ICT in their work after the training.

*Singapore:* NIE has introduced the Advanced Diploma and Advanced Postgraduate Diploma in education programmes to enable teachers to upgrade and update their content knowledge of school subjects or state-of-the-art educational methodologies or technologies, guidance and counselling methods and educational administration courses. The Advanced Diploma in Information Technologies in Education has already taken in three cohorts of teachers. Advanced diplomas provide an alternative route for admission into the Institute’s bachelor’s and master’s degree programmes. However, the teachers can opt to sign up for individual modules in the programme and hence have a wider choice of continuous in-service professional development. The advanced diplomas and their accreditation framework also ensure better articulated linkages between in-service training and the career paths of teachers by providing greater opportunities for teachers to upgrade to degree and postgraduate qualifications.

*Thailand:* Based on IPST’s experience in the provision of in-service teacher training, it is necessary to provide training material or software for use in the classrooms. A written permission from the school principal is required to warrant the use of these materials in the school, stating further that the trained teachers are expected to provide training to other teachers in their schools and in other schools. A series of training courses will help to ensure that the courses are offered effectively.

Another good strategy is for schools that already have ICT tools to provide their teachers with training on the use of available resources and tools.