
# INTEGRATING ICT IN TEACHING AND LEARNING:

# COUNTRTY REPORT: MALAYSIA

by

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## Abstract

*Malaysia has long recognised the importance of ICT to spur the national development. National IT Council and National IT Agenda were formulated in 1990 and 1996 respectively. This is further emphasised under the Vision 2020 policy in 1996. The policy project Malaysia to be a fully developed nation by 2020. The Government has embarked on a high impact programme - The Smart Schools initiative – in 1999 to realise that vision in the education field. In an effort to measure the status of the schools in terms of ICT culturisation and integration of ICT in education, a Smart School Qualification Standard (SSQS) was introduced in 2007. About 4,000 schools have been rated and 89% have shown to be practicing various levels of ICT integration in teaching and learning. A case study involving 1856 teachers indicated that teachers need a lot of help in ensuring ICT is properly integrated into the classrooms. A summary of the status of the integration as per the Guidelines provided by UNESCO is also given together with challenges and proposed solutions.*

## Introduction:

'Information Communications Technologies,' (here with a particular emphasis on the 'information' dimension) will require that governments reassess preconditions: regulations (direct or indirect), levels of democracy, idea formulation and other aspects that will develop the process of knowledge and information exchange [(1)] .
UNESCO defines the term 'information and communication technologies (ICT) as:

*The system of various technologies, tools, and devices that are used to transmit, process, store, create, display, share or exchange information by electronic means*[3]

Various technologies such as computers and its peripherals, video, radio, television, compact disc (CD), DVD, telephone (mobile and fixed line), personal digital assistants (PDA), digital cameras, satellite systems, network hardware and software as well equipment and services associated with these technologies, such as video conferencing, emails, web logs (blogs), social networks (such as Facebook, Friendsters, and Twitters), fall under this rather large umbrella term.
Malaysia has introduced various initiatives to facilitate greater integration of ICT especially in the field of education, as outlined in the country's ICT Master Plan [2]. This paper provides a brief outline of the ICT policy and ICT initiatives in Malaysia. Further, a case study on a programme undertaken by the Educational Technology Division, Ministry of Education in helping teachers to integrate ICT in teaching and learning was

enumerated. A brief status report of Malaysia's position *vis-a-vis* integrating ICT in teaching and learning in conjunction with the UNESCO Case Study Guidelines ([3]) was also provided.

## ICT in Malaysia

Malaysia has long recognised the transformational ability of ICT that would propel the country from p-economy to k-economy. The national ICT Council (NITC) was formed in under the 6th Malaysian Plan (1990-1995) to ensure ICT would be well integrated into the fabric of the Malaysian society. To further the agenda of the NITC, National ICT Agenda (NITA) was formulated in the 7th Malaysia plan (1996-2000) as a catalyst to transform Malaysian economy into value-based economy with development human capital, infrastructure and applications[4]. It was during this period that the Multimedia Super Corridor (MSC) was launched.
In an effort to move towards a knowledge-based economic nation, an effective utilization of ICT as tools as well as enabling access to all levels of the population to ICT are the fundamentals that must be laid out very soundly. Policies that will move Malaysia in that direction must be put in place. Of particular important is the Vision 2020 policy that sees Malaysia as a fully developed nation in 2020 in her own mould. To drive the transformation, Malaysia Multimedia Super Corridor(MSC) was established in 1996. Modeled to be a world-class hub for development and nurturing of the Nation's ICT industry, the MSC provides first-world knowledge and infrastructure, at developing-nation costs[6]. In line with the country's information and communication technology (ICT) master plan ([2]) and Vision 2020 [6], which envisages its longer-term development, Malaysia recognises that the transformation of its education system is fundamental to achieving its objectives. The Ministry of Education, with the participation of non-governmental agencies, is focusing on the development of new media for use as educational, organisational and partnership-building tools, and as a means for bridging the country's digital divide and empowering learners. Due to its belief that ICT can revolutionise education and learning, the Ministry plans to integrate ICT into education on a fundamental level, incorporating systems to facilitate management, information gathering, access, and various forms of communication.

## ICT in education policy

The Ministry of Education articulation of ICT in education focused on three main areas.[7]

- ICT will be used as an enabler to reduce the digital divide between the country's schools by enabling ICT access for all students;

- ICT will be used as teaching and learning tools in education, taught as an independent subject and integrated into others; and
- ICT will be used to enhance efficiency, effectiveness and productivity of management in education.

The translation of the policies into real life calls for transformation of the ICT development plan. Malaysia ICT development plan aims to:

- Intensify the development of the ICT infrastructure;
- Expand access to and equity for ICT facilities;
- Improve assessment and evaluation systems using ICT;
- Emphasise ICT integration into teaching and learning processes;
- Improve ICT knowledge and skills of students, teachers and other personnel;
- Intensify usage of ICT in education management;
- Improve the management and maintenance of ICT equipment;
- Increase research and development efforts in ICT; and
- Increase cooperation between educational institution and the community towards expansion of ICT in education.

## Strategies

Implementation strategies to achieve Malaysia's ICT in education objectives include:

- Preparing appropriate ICT equipment and infrastructure for all schools;
- Introducing ICT curriculum and support for ICT integration into general teaching and learning;
- Upgrading the ICT skills and knowledge of both teachers and students;
- Increasing ICT use in educational management; and
- Upgrading ICT maintenance/management in educational institutions.

## Major ICT initiatives in education

The implementation of the Ministry's policy in ICT can be seen through several major ICT in education projects, some of the major initiatives are:

### 1) ICT for all students to bridge the digital divide between schools

***The Smart School project***

The project was successfully piloted from 1999-2002 involving 88 schools including new and existing schools. The forward looking ICT-mediated project attempted to systemically transform the schools in terms teaching and learning practices and school management processes in order to prepare the students for the information age. The Pilot Project was one of the Flagship Application under the MSC. The project was implemented by the Government in collaboration with a consortium led by country's major telecommunication company. The implementation were scheduled to go through four waves, viz; the pilot (1999-2002), the post-pilot (2002-2005), making all schools smart (2005-2010), and consolidation and stabilisation(2010-2020) [8]

*Computer laboratories*

The government has built in phases computer laboratories in 6633 schools, including in the remote areas in an effort to bridge the digital divide.[9] The laboratories are equipped with basic ICT facilities such as PCs, Local Network, printers and servers.

*Teaching of Mathematics and science in English*

In a major move to prepare students for the challenges of the information age, the Government had decided in 2003 to change the medium of instruction for Mathematics and Science from Bahasa Malaysia (the national language) into English. Under the massive programme, 132,649 laptops, 78,333 LCD projectors, 67,439 screens, 63,254 mobile trolleys, and 9,662 printers were provided in phases to all the schools in the country.[9] 200,000 teachers have been trained ICT in basic ICT skills and using ICT in teaching and learning until 2007.

*WebTV*

The WebTV initiative is a medium to provide teachers and school communities on line streaming teaching and learning materials. With the tagline Education for All, seven channels were provided, namely: news, magazines, academic, curriculum, live shows, interviews, and interactive channels[12]. WebTV enable the teachers to access materials anywhere and anytime as long as internet connection is available. With the internet connection reaching almost 96% of the schools, WebTV is another avenue to help the schools' communities access to quality teaching and learning materials. Furthermore, students who are out of the country are no longer deprived of materials from their own country.

*SchoolNet*

The Government is providing internet access with 1Mb/s in 9654 locations. By 2010 internet access with 4Mbps would be available in 579 locations. As it stands now, all of the 88 benchmark smart schools are already enjoying fast 4Mbps internet connection.

*School Access Centres*

The computer laboratories in schools may not be accessible to students after school hours and another computer initiative undertaken by the Government is to provide schools with computer access centres. With the access centres, students can use computers even after school hours especially in accessing the internet and doing collaborative projects. Computer access centres have been installed in 3029 schools since 2006 with 70% rural schools and 30% urban schools distribution. [10].

*Transforming all the schools to smart schools*

As a strategy to turn all the schools smart and further reduce the digital divide between the schools and improving access and equity to ICT, the Government is leveraging and synergising on the various ICT initiatives explained above into one galvanising effort. The making school smart programme is a logical continuation to the pilot smart school initiative. It is the third wave of the Smart School Implementation Plan[8]. The massive programme aimed to integrate ICT in teaching and learning practices so that learning can be more engaging and meaningful; to provide a more efficient school administrative and learning management system, improve equity and access to ICT infrastructure to urban, rural, and remote schools; tapping the students potential to enable them to notch up to higher order thinking skills; and encouraging students and teachers to be more autonomous in their learning.

2) ICT as a teaching and learning tool

The Ministry does not see ICT as the silver bullet to attain a higher level of educational excellence. ICT remains as a tool or enabler and a powerful one too. As such, in terms of teaching and learning, the Ministry endeavours to employ ICT to make lessons more interesting, relevant, and meaningful. ICT had the capability of bringing the world into the classrooms, providing access to quality teaching and learning materials to the areas not reachable by conventional means; and ultimately improve information literacy.

In this respect, the Ministry had produced a variety of teaching and learning materials ranging from audio CD, video CDs, interactive CD ROMs, web-based multimedia contents as well as providing access to on line teaching and learning materials. A total of 3778 titles of teaching and learning materials have been produced and dispersed to schools from 1999 – 2008. [11]

Teachers and students had access to an array of ICT tools at their disposal such as electronic presentation, word processing, spreadsheets applications; electronic publishing. With the internet, they had access to web editing facilities; emails; electronic forums; chats; external electronic resources; and databases.

3) ICT as a productivity tool

Educational organizations must use computers to improve efficiency. Computers can be used in a variety of ways and situations in support of operations in schools such as maintaining students' records, managing curriculum content, supporting pedagogy; maintaining timetables and classes; financial management, communication; library management; inventory management and hostel management.

The Education Ministry has been using computers to improve efficiency for many years. Legacy systems such as Educational Management Information System (EMIS), Students information System (*Sistem Maklumat Murid – SMM*), Students Discipline System (*Sistem Salahlaku dan Disiplin Murid – SSDM*) have been the back bone of the data gathering systems in schools. This is supported by many other systems such as Textbook Loans Management Systems (SISTEKS), school time table systems, and various other systems either procured by the states or district education departments or built by the schools themselves.

Under the Smart School programme (1999-2002), a browser based integrated school management application called Smart School Management System (SSMS) was built as a comprehensive system encompassing 10 school management functions into 32 modules. This later morphed into a web based school management function called Web School Management System (WSMS) in 2006. In 2009, an updated school management system called *Sistem Pengurusan Sekolah* (SPS) is introduced.

### Integrating ICT into teaching and learning

The role of ICT as an enabler in education has been well documented and individual's ability to capitalise and leverage on the capability of ICT to gain knowledge is very important. However, it is necessary to provide a strong rationale why ICT need to be integrated into teaching and learning. History have shown that an array of new technologies such as radios, televisions, slide films projectors, overhead projectors were initially thought to have huge potential in improving education but the reality was they brought forth only little impact on improving meaningful learning to teachers and students in schools. Notwithstanding that, many reports such as Newhouse [13], Committee Developments in the Science of Learning [14], Riel, M.[15], Laferriere,T , Breuleux,A., Bracewell, R [16] and Baker, E.L., Gearhart, M., Herman, J.L., [17] agreed that ICT is a mediator of learning in the multi components learning environment and ICT have been shown to support students and teachers in improving learning outcomes.

Newhouse [13] further suggested that integrating ICT in teaching and learning is useful in areas such as investigating reality and building knowledge; active learning and authentic assessment; motivational and challenging engagement; increasing learner independence; tools for higher order thinking; collaborative and cooperative learning and tailoring learning to learner.

Integrating ICT in teaching and learning can be done directly with IT as a bona fide subject, IT as a part of other subjects or infusing IT elements into various subjects. In integrating ICT in teaching and learning, the Ministry has introduced IT literacy as a subject at primary level. At secondary level, IT is a subject on its own and it is offered as an elective subject for Form 4 and Form 5. Furthermore, ICT components were built in into subjects like music, visual art education, mathematics, science, English (as a part of the teaching of mathematics and science in English programme), and Islamic Studies. Digital supporting materials are available in almost every subject in the form of teaching and learning coursewares.

**Status of integration of ICT in teaching and learning**

UNESCO has proposed a model of four stages of ICT usage in schools [2]. The stages are Emerging, Applying, Infusing, and Transforming.

It is difficult to pinpoint the status of the integration of ICT in teaching and learning in the country in absence of full scale country wide in depth survey. The emerging stage identifies with early journey in using ICT in teaching and learning. In terms of usage, teachers and users just became aware of ICT as tools of teaching and learning. As far as Malaysia is concerned, computers have been used in schools since the eighties and it is evident that by now Malaysia has passed the Emerging stage. With a total of 13, 256 ICT equipment have been provided under the Smart Schools initiatives [24], Internet users is almost 60% of the population [5], and 9,884 schools have accessibility to the internet, Malaysia is well into Application stage and already zooming into the Infusion stage. In fact on certain aspects, Malaysian is already moving into the Transformation stage. Further discussion on the stages is given below.

***Star Ranking using the Smart School Qualification Standard (SSQS)***

A useful indicator to the stage that we are in is in the results of the Star Ranking exercise using the Smart School Qualification Standard (SSQS) certification exercise. The SSQS was launched in 2007 to gauge the status of the integration of ICT in schools. The domains of the SSQS and summary of their respective indicators are given **Table 2** below.

**Table 2: Domains of Smart School Qualification Standard (SSQS) and Main Key Performance Indicators**

| Domain and weightage | Main Indicators |
|---|---|
| **Utilization (40%)** – Extent of ICT integration in operation, teaching and learning and school administration activities | |
| | Development of in-house multimedia teaching learning materials by teachers |
| | Use of learning management system and school management system |
| | Frequency of using materials from educational TV/WebTV |
| | Student to PC contact hours |
| | Use of coursewares in teaching and learning in core subjects |
| **Human capital (40%)** – ICT competencies of administrators teachers, IT coordinators and students | |

| Domain and weightage | Main Indicators |
|---|---|
| in integrating ICT in teaching and learning and administration | |
| | IT competencies of technical personnel |
| | IT competencies of core subjects teachers in terms of basic skills, using TLM, developing TLM, and integrating IT in TL |
| | Students awareness of availability of TL coursewares |
| | Smart partnership |
| | Training |
| | Use of ICT in information dissemination and communication |
| | Change management |
| **Application (10%)** – Adoption and use of the various application systems in school administration and teaching and learning | |
| | Use of at least 5 modules of school management and other management applications for operation. |
| | Presence of properly maintained school web site and electronic communication with proper e-mail address |
| | Use of courseware in teaching and learning via Learning Content Management System |
| **Infrastructure (10%)** – ICT infrastructure in schools | |
| | Ratio of ICT equipments to students, teachers, and class |
| | Networking (LAN and WAN) |
| | Maintenance and support system, downtime |
| | No of computer laboratories in working conditions |

These domains have been used to rate schools on their readiness to be declared as smart schools as well as the status of the current smart schools. The Star Ranking system was devised in conjunction with the SSQS. In short, the SSQS is a measurement tool that uses a Star Ranking system as a performance indicator that reviews the use and outcome of the integration of ICT in the schools.

The Star Ranking is awarded based on a unified score from the indicators mentioned above. The Star Rankings are provided in **Table 3** below.

**Table 3: SSQS Score, Star Ratings, and Status of Schools**

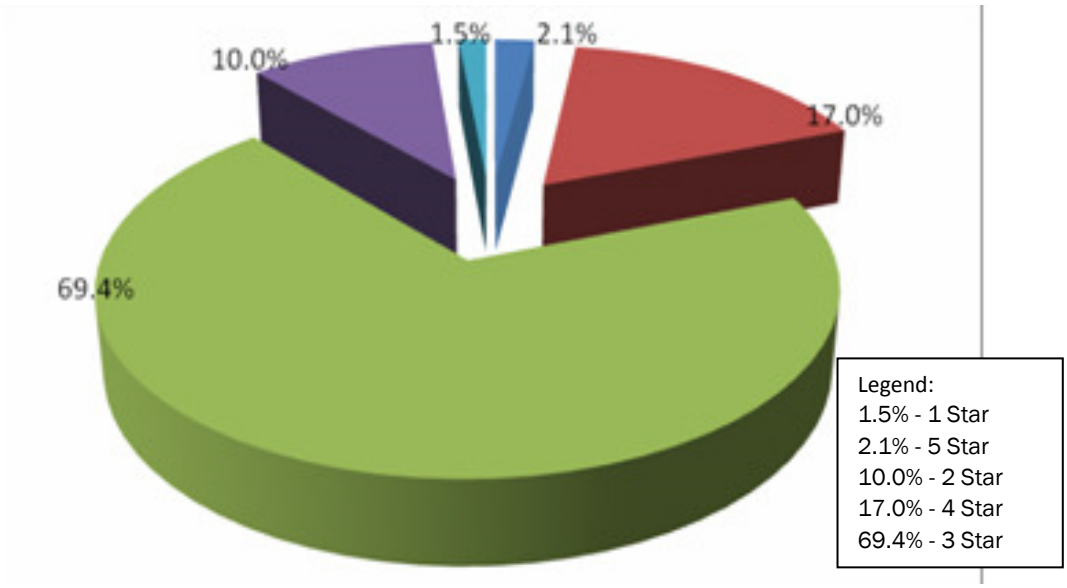
| Score | Star | Level | Status |
|---|---|---|---|
| Less than 50% | Basic (*One star) | Schools merely meeting the basic conditions across all indicators | Not meeting smart School Standards |
| 50%-60% | Basic Plus (**Two Star) | Schools with basic features with slight additions but falling below average for all indicators. | |
| Score 61% - 70%. | Median (***Three Star) | Schools with fair or average conditions of all indicators | Qualified to be certified Smart Schools |
| Score 71% - 80% | Advanced (****Four star) | Schools with good or advanced conditions across all indicators. | |
| Score more than 90%. | Advanced Plus (*****Five Star) | Schools with highest ranking with advanced conditions for most indicators. | |

(*Source: Hj. Mohd. Adenan bin Deraman; Antara Konsep, Pelaksanaan, dan Pencapaian: Sekolah Bestari Seminar Sedekad Sekolah Bestari, Putrajaya, 27-29 April 2009.*

In 2007 when the Star ranking system was first applied to the 88 existing Smart Schools, only 25 schools rated 5 star and 8 schools achieved merely 1 star with the rest falling between the two. The exercise was repeated twice in July and December 2008 with 69% and 89% increase in ranking positions of the schools. By December 2008, 77 of the 88 smart schools had achieved 5 star status and only two schools remained with 2 star. None of the schools downgraded to 1 Star or 2 Star.

As of July 2008, 3925 schools were rated and 88.5% (3475 schools) were accorded at least 3 Star Rating, indicating that they have achieved the minimum requirement to be smart schools [25]. **Figure 3** shows the

percentage of schools and their Star ratings as of July 2008.




(*Source: Hj. Mohd. Adenan bin Deraman; Antara Konsep, Pelaksanaan, dan Pencapaian: Sekolah Bestari Seminar Sedekad Sekolah Bestari, Putrajaya 27-29 April 2009.)*

**Figure 3: Star Ratings of schools as of July 2008**

By extension, it is quite logical to conclude that at least 88.5% of the 3925 schools have been practicing ICT in teaching and learning, bearing in mind that the Utilisation, Human Capital and Application domain of the SSQS scores which made up 90% of the score included elements of integrating ICT in teaching and learning.
The Ministry of Education is targeting all schools (roughly 10,000 schools) to achieve at least a 3 Star status by 2010. In 2010, at least 500 schools (5%) of the schools accorded with 5 Star rating. Going by the indicators of the SSQS, schools with 5 Star rating would be able to use learning management systems, integrate various teaching and learning materials (including digital materials) in the classrooms, create and maintain school web pages for various activities, and uses various modules of the school management system. Mapping these back to the various stages of ICT Implementation in Schools as proposed by UNESCO [3], it can be concluded that Malaysia have passed the emerging stage and rapidly moving from the applying to the infusing stage with sizeable pockets of areas already in the Transformation stage. **Appendix 1** provides the summary of the key stages in Malaysia.

## Conclusion

In terms of integrating ICT in teaching and learning, the implementation of Pilot Smart Schools in 1999 – 2002 and the subsequent expansion of the Smart Schools initiative had brought valuable lessons to the Ministry of Education. We have learned that in the days of rapidly changing technology we can no longer formulate plans with one size that fits all. All stakeholders must be brought together so that future plans take into account the

latest development and future trends of the industry. There is a pressing need for schools to be able to build their own repertoire of teaching and learning materials that fit their school requirement. On that note, a drastic change in the mindset of the schools and the community is needed in order to transform the curriculum and assessment with ICT as the key enabler. Integrating ICT in TLM must focus on producing students that are creative, innovative and critical as outlined in the National Education Philosophy.

As a conclusion, **Table 4** summarizes the challenges and issues and possible solutions on integrating ICT in teaching and learning.

**Table 4: Summary of Challenges/issues and Proposed Solutions**

| No. | Challenges/Issues | Solution |
|---|---|---|
| 1 | Continuous monitoring and coaching of innovative use of technology in schools | Dedicated division in the Ministry of Education to manage all the teaching and learning related ICT initiatives.<br>Making full use of school management systems to increase efficiency and monitoring.<br>High level Technical Driving Committee to coordinate and facilitate all ICT initiatives in schools. |
| 2 | Changing the mindset of teachers and stakeholders | Change management training and regular monitoring.<br>Schools to devise own change management programmes. |
| 3 | Rapid change of technology | Forward planning with the help of industry leaders to predict future trends. |
| 4 | Increasing operating costs | Training local students to be a member of Cyber Brigades to do small technical maintenance works.<br>Leveraging on the various ICT incentives already existing in schools.<br>Getting more industry players and the community to be involved in schools projects as part of smart partnerships. |
| 5 | Maintenance of hardware and software | Set up of centralised help desk |
| 6 | Producing coursewares compatible with rapid changing needs of schools | Training teachers to build own materials.<br>More on demand TV programmes to be streamed via web TV. |
| 7 | Capacity building of qualified personnel | Continuous training programmes to improve culturisation of ICT in schools and to improve competencies in integrating ICT in T&L. |

## References:


1. Asia Pacific Develoment Information Programme: Realizing the Millennium Development Goals http://www.apdip.net/projects/rhdr, accessed on 24/05 2009).

2. Regional Guidelines on Teacher Development for Pedagogy-technology Integration. Working Draft. Asia Pacific Regional Bureau for Education, Bangkok Thailand, Asia-Pacific Programme of Education innovation for Development, Bangkok, Thailand, 2004

3. The Regional Workshop on Integrating in Education in the SEAMEO Member Countries, Case Study Guidelines, 2-3 June 2009, Bangkok, Thailand.

4. Strategic ICT Roadmap for Malaysia: Ministry of Science Technology and Innovation; https://mail.moe.edu.my/webmail/src/webmail.php., accessed on 10/05/09]

5.Asian countries Internet users by population (http://www.internetworldstats.com/stats3.htm, accessed on 10/05/09),

6. http://www.mscmalaysia.my/topic/12066955968788. Accessed on 20/05/09

7. Malaysian Smart School Roadmap 2005-2020: An Educational Odyssey; Multimedia Development Corporation, Cyberjaya: 2005].

8. http://www.unescobkk.org/index.php?id=1385 accessed on 20/05/09)

9. Briefing Notes to the Director of Educational Technology Division, Ministry of Education, 2009].

*10.* Report on the Implementation of Access Centre, Ministry of Education, 2009).

11. Senarai Judul Bahan Pelbagai Media 2008, Sektor Pembangunan Pelbagai Media. Educational Technology Division, Ministry of Education, 2007

12: http://www.eduwebtv.com.my/index7.php, accessed on 25 May 2009)

13. Newhouse, C.P.; A literature Review: The impact of ICT on Learning and Teaching, Westren Australia Department of Education, 2002),

14. Committee Developments in the Science of Learning (ed), 2000, How people learn: Brain, Mind, experience, and School. Washington D.C; National Academy Press];

15. Riel, M.M: Just in time learning or learning communities.Abu Dhabi: The fourth Annual Conference of the Emirates Centre for Strategic Studies and Research; 1998

16. Laferriere,T , Breuleux,A., Bracewell, R. (1999). Benefits of using ICT for teaching and learning in K12/13 Classrooms: SchoolNet Program Industry Canada

17.Baker, E.L., Gearhart, M., Herman, J.L., (1994). Evaluating the Apple Classrooms of Tomorrow. In JL Baker and HF O.Neil( ed), Technology Assessment in Education and Training, Hillsdale, New Jersey: Lawrence Earlbum

18. Rogers,E.M., (1995), Diffusion of Innovation; 4th edition; New York: the Free Press

19. Wan Zah Wan Ali, Hajar Mohd Nor and N. Alwi, March (2009). The conditions and level of ICT integration in Malaysian Smart Schools, International Journal of Education and Development using ICT,5(2); http://ijedICT.dec.uwi.edu/, accessed on 10/05/2009)

20. Laporan program pengintegrasian perisian kursus pendidikan. Sektor Pelbagai Media, Educational Technology Division, Ministry of Education, 2006.

21.Cited in Laporan program i-Learn, Sektor Pembangunan Pelbagai Media, Educational Technology Division, Ministry of Education, 2007

22. Rahim Bakar and Shamsiah Mohamed, (2008), Teaching using ICT: Do trainee teachers have the confidence?; International Journal of Education and Development using ICT, 4(1) http://ijedict.dec.uwi.edu/, accessed on 10/05/2009)

23. Gimbert, B. & Zembal-Saul, C. (2002). Learning to teach with technology: From integration to actualization. *Contemporary Issues in Technology and Teacher Education* [Online serial], *2*(2). Available: http://www.citejournal.org/vol2/iss2/currentpractice/article1.cfm. Accessed on 15/05/09].

24. Laporan awal dapatan Kajian Penggunaan Bahan Digital terbitan KPM, 2009, Educational Technology Division, Ministry of Education],

25. Hj. Mohd. Adenan bin Deraman; Antara Konsep, Pelaksanaan, dan Pencapaian Sekolah Bestari. Seminar Sedekad Sekolah Bestari, Putrajaya 27-29 April 2009.

Appendix 1

## Stages of ICT integration in education in Malaysia

| STAGES | | | | |
|---|---|---|---|---|
| | **Emerging** | **Applying** | **Infusing** | **Transforming** |
| **National ICT in Education Vision** | | | | • Leadership set vision of transforming the nation into a developed nation by 2020.<br>• Transforming the learning institutions via the smart schools to prepare students for the information age.<br>• The smart school concept translated from 2020 Vision is emulated in various ASEAN and Middle Eastern countries. |
| **National ICT in Education Plans and Policies** | | • Centralised policies.<br>• Funding by federal government as well as in smart partnerships with industry players. | • Under transformation of curriculum, ICT is integrated across all subjects. | Clear ICT policies in education:<br>• As a teaching and learning tool, bridging the digital gap and productivity tool. |
| **Complementary National ICT and Education Policies** | | | | • ICT policy in education reflects the country needs for k-workers and preparing the future generations for the information age. |
| **ICT infrastructure and resources in schools** | | | • A total of 10,699 titles of curriculum based and subject based materials of various media have been produced.<br>• 155,516 computers in 3,029 schools' access centres<br>• 6,633 schools with computer laboratories.<br>• A total of 288,083 of | • Whole range of ICT based teaching learning devices (such as computers, LCD, internet, smart board, scanners, digital cameras, etc are widely available)<br>• Fully fledged web based Learning Management |

| STAGES | | | | |
|---|---|---|---|---|
| | Emerging | Applying | Infusing | Transforming |
| | | | equipment (such as laptop, printer, LCD screens etc) have been installed under the Teaching of Maths and Science in English Programme.<br>• 13,982 ICT equipments were installed in the 88 Smart schools.<br>• Ministry planned to improve PC: student ratio to be 1:20 and notebook/PC to teachers to 1:2 by 2010.<br>• As of March 2009, access to internet via SchoolNet available in 97.6% (9654 schools) of schools.<br>• 600 locations to be upgraded from 1Mb/s to 4Mb/s in 2007-2009. | System would be integrated with the School management System by October 2009.<br>• Distance education available in tertiary education.<br>• Web based e-learning courseware started in 2004. As of 2008 1220 titles of web based materials were available.<br>• Educational WebTV is running and accessible with 7 channels to provide educational video in demand streaming facilities.<br>• Autonomy given to 30 cluster schools.<br>• Under curriculum transformation, teachers would automatically use ICT in teaching and learning across all subjects.<br>• Nationwide centralised maintenance help desk system (Support Ticketing System-STS) has been implemented |
| **Professional development for Teachers and School Leaders** | | | • 200,000 teachers trained in ICT as of 2007.<br>• Collection of 6,000 lesson plans to guide teachers in teaching using ICT.<br>• Programme involving 1,836 teachers in integrating ICT teaching | |

| | STAGES | | | |
|---|---|---|---|---|
| | Emerging | Applying | Infusing | Transforming |
| | | | and learning conducted in 2006 and 2007.<br>• On line Training Management System for school managers | |
| **Community/Partnership** | | • Parent-teacher association, alumni, and industry players contribute for equipment. | Smart partnerships with industry players such as:<br>• Oracle Corporation Think.com in 822 schools(2006-2010),<br>• Intel Corporation's Classmate PC in 300 schools (2009),<br>• VDSL in Terengganu Cyber School Project,<br>• Maxis Corporation's CyberKids Camp in 1270 schools, 2436 teachers and 4925 students (2007).<br>• Formulai 1 in Schools – 50 schools<br>• Robotic in schools – 300 schools<br>• 6,000 volunteers hours provided help to 25 schools in 3 states by Intel Corp. | • 39 community colleges to promote lifelong learning (2009) |
| **Assessment** | | | • School based holistic assessment (SPPK) with students' portfolios to be implemented in 2011.<br>• Evidence gathering of formative evaluation using school management system.<br>• Item Creation management System (ICMS) is being tested (2009) | |
| **Teaching and Learning Pedagogies** | | • ICT as a subject in secondary schools | • ICT is infused into other subjects.<br>• Collaborative learning projects via 155,516 computer s in school Access Centres. | • Critical thinking, language, multiple-intelligences, values and skills were infused across the curriculum since 1983 and also across the curriculum standard to be introduced in 2011. |
| **Evaluation and research** | | | • ICT strategic planning (ISP) was done based | |

| STAGES | | | | |
|---|---|---|---|---|
| | Emerging | Applying | Infusing | Transforming |
| | | | on research and survey of the existing situations in schools. It has undergone three revamps since early 2000s. | |