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Supporting Smart School Teachers' Continuing Professional Development in and through ICT: A model for change

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ABSTRACT

The general assumption that once the hardware is introduced in schools, ICT integration will automatically follow is not necessary true. Teachers need to be supported and factors responsible for teachers' failure to integrate ICT into the classrooms identified and rectified. The paper proposes an online model based on the Improvement Quality Education for All (IQEA) action research framework for school improvement (Hopkins et al 1996). The ultimate goal is to bring together the school-based cadres to share emerging issues, themes and evaluation and eventually develop expertise in managing change in their own institutions and beyond through the use of ICT. This concept paper provides the background, rationale, framework and the methodology of this research project.

Keywords: *professional development; smart school teachers; ICT; quality education, knowledge-based schools, community of practice*

INTRODUCTION

Over the past decade we have seen new technologies being introduced into schools in developing countries in order to enrich the teaching and learning experience of students and to meet the goals of reform agendas dictated by national governments. Malaysia is one such country. These top down reform agendas are predicated on an assumption that once the hardware is made available to teachers and students in schools, Information and Communications Technologies (ICT) integration will automatically follow. However, as we have seen from the Malaysian experience, in reality this is not necessarily the case. The full integration of ICT into professional practice requires teachers who themselves understand and believe in the capacity of the new technologies to transform learning in positive ways. However, many do not appear to share this belief nor do they necessarily believe that they need to provide students with the opportunity to develop ICT skills and learning habits which are required to engage in a progressive society and become life-long learners. Others may argue that ICT can immeasurably enrich the learning resources and materials available to learners but without first winning the hearts and minds of teachers this is a hollow boast.

Local researchers (Siti Suria Salim & Sharifah Mohd. Nor 2005; Azizah et al 2005; Hajar Mohd. Nor 2005; Lee 2007) have separately reported in their investigations on Smart school teaching and learning in Malaysia that while the school, teachers and students were excited with the prospect of using ICT in their learning environment, its use was limited to using the word document for assignments and the internet to source related information for the assignments. Occasionally the teachers use PowerPoint in their teaching but mostly resorted to 'chalk and talk' approach as they felt they had insufficient time to prepare. Mostly the teachers confessed that their teaching style and approach, "have not changed much" as the computer was still used sparingly in their own teaching. The teachers had also indicated that they needed further training in creative use of ICT in teaching, in particular for their own teaching environment. On the other hand, students expressed frustration that the teachers were not ICT savvy and did not create opportunities for them to engage in the use of ICT in their learning. Unless this situation is recognized and addressed, the concept of Smart School Education, to invoke transformation towards enhanced quality of teaching and learning through integration of ICT in the learning environment, will not be achieved.

If policy-driven educational reform programs are to be successful and sustainable it seems that more is required to bring teachers on board to spearhead such change. We argue that it is necessary to provide teachers with the pedagogical, social, cultural and emotional support that will enable them to fully integrate ICT into their teaching, as well as provide them with the necessary funding and resources. However, in order to provide the necessary support there is a need to identify the range of factors responsible for teachers' apparent failure to integrate ICT into their classrooms. Teachers' efforts to introduce ICT into their professional practice are influenced both positively and negatively by two important variables, extrinsic and intrinsic. Ertmer (1999) describes extrinsic factors as first-order barrier to ICT integration, which includes obstacles such as: the lack of access to required hardware and software; insufficient time for teachers to plan instruction and to familiarize themselves to ICT; and inadequate technical training and administrative support. Second-order barriers, on the other hand, are obstacles that impede fundamental change towards ICT integration into the learning environment or school culture. These obstacles are usually rooted in teachers' underlying beliefs and values about teaching and learning but may not be immediately apparent or in the consciousness of teachers themselves. According to Dede (1998), second-order barriers may be more difficult to overcome than first-order barriers as they are more personal, emotionally connected and therefore more deeply ingrained. This barrier includes teachers' apparent unwillingness or reluctance to embrace ICT as a means towards improving teaching and learning.

We will argue that in order to effect lasting changes in practice, teachers need to be provided with the professional development opportunities which will enable them to successfully integrate ICT into their everyday teaching. This means that as well as the technological infrastructure being in place, the social, cultural and psychological development of teachers is seen as of paramount importance in order to facilitate attitudinal and behavioral changes in classroom practice. This paper will first trace the development of the Smart Schools initiative, in Malaysia. It then goes on to discuss the problems and challenges faced in the implementation of the initiative to date and finally outlines a model for change based on an on-going research project, designed to evaluate the effectiveness of a professional development intervention with a cohort of teachers recruited from three Smart Schools (secondary) in Malaysia.

NATIONAL POLICY TOWARDS ICT IN EDUCATION

Recognizing that technological change has become increasingly important in developing a knowledge-based economy, the Malaysian government is presently in the process of strengthening the ICT sector. Education is one of the major sectors focused on by the

government to achieve the declared aim of developing a knowledge-based economy and facing economic and educational challenges from other countries. The government aims to position Malaysia as a globally competitive knowledge-based economy with full access to knowledge and information through ICT. The main thrust of the Malaysian Ministry of Education policy is the optimalization and utilization of ICT in schools nationwide (Ministry of Education Malaysia 1997). To achieve this goal it is plainly necessary to ensure that teachers are professionally equipped for this challenge.

In line with the targets for Vision 2020, billions of ringgit was allocated for ICT-related programs and projects in the 8th (2001 to 2005) and 9th (2006-2010) Malaysia Plans. The plan includes supplying 8,000 schools in both urban and rural areas nationwide with computers. According to the Education Development 2001-2010 Report (Ministry of Education 2001), out of the 8,000 schools in the School Computerization Project, 2,418 were primary schools, demonstrating the Ministry's intention to integrate ICT into the educational experience of even the youngest students. Through this project, fully equipped computer labs, together with Internet and LAN facilities were provided in each participating school. The drive was to ensure that the use of computers and ICT would be fully integrated into the learning and teaching process across the school phases. Thus in order to provide the necessary skills for teachers, the Malaysian Ministry of Education organized a series of professional development courses and ICT training to provide the appropriate skills and knowledge in order to produce skilled and computer-literate teachers. Through this program, it was envisaged that about 10,000 teachers would be trained by the end of 2007. During the training, the intention was to expose participants to the information technology management skills necessary for effective teaching and learning as well as using computers as part of everyday teaching and incorporating multimedia in education and resource development.

Under the 8th Malaysia Plan, a total of RM1.82 billion was further allocated for the Multimedia Super Corridor (MSC) flagship application (Economic Planning Unit, 2001). The MSC aimed to provide the most conducive environment to achieve the government's goal of becoming a world-class information and multimedia player in the information age. One of the seven flagship applications of the Multimedia Super Corridor (MSC) was the Smart School Project which was initiated in 1999. The project was meant not only to equip students with greater IT, science and technological competence, but also to bring about a systemic change in education, a root and branch paradigm shift – away from an examination-dominated, teacher-centered instructional educational culture to one which fosters and consciously seeks to develop students as creative, autonomous learners facilitated by a technologically enriched classroom environment and taught by teachers who embrace the potentials that technologies can offer to the learning process (Ministry of Education 1997).

Nine years have passed since the Smart School project was first implemented, and there remain major concerns among educationists and within the Ministry of Education itself regarding the overall success and effectiveness of this expensive initiative. In order to understand how these concerns have arisen, it is necessary to take a closer look into the context and background to the Smart Schools themselves in Malaysia and examine the issues which arose in the start up phase.

THE CONTEXT OF SMART SCHOOLS IN MALAYSIA

The Malaysian Smart Schools could be categorized as technology-rich schools but are also much more. They are also intended to be the flagships of educational change, serving as centres of excellence for schools in their locality. They are known universally in Malaysia as Smart Schools

but are also locally known as ***Sekolah Bestari*** and most recently as K-schools or Knowledge-based schools. This term roughly translates as a learning institution that has systematically 'reinvented' itself in terms of teaching and learning practices and school management in order to prepare students educationally for the Information Age, to take their part in a globally competitive, knowledge-based economy and to promote the goals of the National Philosophy of Education. They are also intended to act as catalysts to achieve the Malaysia Vision 2020 to make Malaysia a leader in information and communication technology in the region and beyond. A total of 90 out of over 8,000 schools from all over the country were selected and equipped with technological infrastructure necessary as part of a pilot project. These schools were expected to serve as the nucleus for the eventual nation-wide deployment or roll out of Smart School teaching concepts, educational resources and materials, pedagogical skills and technologies. Four subjects (English, Bahasa Malaysia, Science and Mathematics) were selected to be taught the 'smart-way' (Ministry of Education 1997).

Technology infrastructure is expected to serve fundamentally as an enabler in these schools, revitalising and refreshing practice in teaching and learning, management and communication. The technology employed within the Smart School infrastructure involves the integration of hardware, software, system software and non-IT related equipment running in both local and in a wide area network. System integration refers to the various technical components and disciplines contained within the system to ensure smooth operational status. The final component of the project was to be the Support Services which included a Help Desk as well as Support and Maintain services.

It was realised that teachers, being the primary deliverers of this radical and innovative Smart School concept, would need a period of intensive training in ICT and strategies for the integration of technology in classroom practice. Teachers in participating Smart Schools were therefore sent on training courses aimed to equip them with the appropriate skill sets to bring about changes in learning and teaching underpinned by the use of new technologies. These began in 1998. These teachers were supposedly learning to be not only competent in teaching and learning approaches which were best suited to using enabling technologies themselves, but also how to coach other colleagues (Ministry of Education 1997). By equipping them with the tools and skills for professional development, it was assumed that any residual resistance to change would dissipate and that back home in their schools, these teachers would help to convert their more technology-resistant colleagues. These implementations are part of the test-bed environment for e-learning development in Malaysia.

A survey conducted in 2005 reported by the Economic Intelligence Unit measuring the e-learning readiness in 65 countries in the world indicated that Malaysia, ranked 35, is moderately ready for e-learning (mean=5.5 on a scale of 10). The readiness of a country as a whole is measured in terms of the presence of a government policy, the role of mass media, IP regulations and proficiency in the English Language. It was also reported that Malaysia ranked eighth in the Asia-pacific region at that time.

However these indicators do not appear to have taken any account of the psychological readiness of these vanguard teachers to adopt the new teaching approaches and methodologies after the training course had ended. No direct research data appears to be available which can throw light on the readiness or willingness of these first cohorts to participate in the training. Whether they were in fact 'pressed people' directed by the school's management to take part in the course, is an unanswered question. Feedback from the review conducted by the Ministry of Education and the Telekom Smart School Team in 2003 however does exist and reported the following with regards the utilisation and application of Smart school teaching and learning materials by teachers in the pilot smart schools:-

1. Teachers were not keen on using the smart school courseware as they found usage of materials directly related to exam preparation saved them preparation time. Furthermore the lessons could not adequately cater to the students' needs and did not reflect the complete curriculum.
2. Lack of monitoring and support made teachers less inclined to be rigorous in implementing teaching and learning the smart school way.
3. Teachers needed more training to use the smart school courseware, and be comfortable with using ICT generally.
4. The in-house training was moderately successful as it was not sufficient in helping the teachers to apply the smart school methodology principles.
5. There is a need to intensify change management programs and pedagogy training for all teachers on how to integrate ICT in teaching and learning.

(Multimedia Development Corporation 2005)

This report makes depressing reading if we accept that as part of the school stakeholders, teachers should have an awareness and understanding of the extent of their role and responsibility in facilitating the success of the smart school system. Such a values-driven buy-in would ensure that they execute their roles and function more effectively. Teachers need to embrace new teaching-culture ways such as keeping up-to-date with current practices and participation in professional networks, allowing exchange of experiences and ideas, and open discourses on effective methodology.

The task of developing an education system with internationally recognized standards of excellence requires teachers who constantly strive to be excellent through professional learning and development and who share the values and aspirations of the nation. To this end, the Teacher Education Division (TED) of the Ministry of Education set up a series of training courses for teachers in order to continuously upgrade and update the professional knowledge, competence and effectiveness of teachers. The training programs were held at teacher training colleges and local universities which themselves have become centers for professional development in teacher education (Ministry of Education 1999).

These professional development courses of 14 weeks duration (on-going courses) were designed to focus on specialized areas in computing: namely Computers in Education; Computerization, and the Use of Computers in the Teaching and Learning of Bahasa Melayu (the Malay Language). The courses are presently being geared towards the training of teachers for the Smart School Project. The TED educators and officers themselves undergo continuous professional development and attend short courses in IT both locally and overseas and share their knowledge and expertise through the in-house training programs organized by the TED (Ministry of Education 1999).

The TED courses adopt 'training the trainers' and cascade models, that are preparing successful participants to pass on their learning to colleagues in schools. The first cohort of trained teachers will become so-called 'master trainers' and will be expected to devise in-service training in their schools in the integration of technologies into the teaching and learning process. These teachers effectively function as in-house resources or ICT champions transferring their knowledge and experience to other teachers in their respective schools (Ministry of Education 1999).

CURRENT AND FUTURE CHALLENGES

The 'top down' policy adopted by the Malaysian government in introducing ICT into schools is in stark contrast to that adopted by other nations in both the East and West. In Australia, Britain, Canada, Ireland, Japan, New Zealand, Singapore and the USA for example, policy initiatives for incorporating ICT into education have tended to be driven by schools themselves, that is, 'bottom up', rather than by their national governments. The schools set development goals themselves, with the governments providing funding and resources. The Smart School Integrated Solution (SSIS) is different in that it is primarily a government-led effort hence it is supported by relevant government policies and legislation. Government takes the lead in setting out the vision, articulating the values, providing the budget, and employing the private sector to provide the necessary expertise for implementation (Bismillah Khatoon 2007).

The challenges faced by the SSIS proved to be external and internal. There was an enormous disparity in the level of ICT availability, efficiency and take up in schools, especially between those schools in rural areas and schools in urban areas. Another challenge was the lack of Internet connectivity. Without the basic infrastructure and connectivity, the integrated system (encompassing web-based courseware, on-line management tools, and technical support) provided by the Smart Schools project was wholly inaccessible to rural schools. The geography of the country itself posed a real challenge for the Ministry of Education. To address this issue head on, the Ministry provided schools in remote areas with special training programs and provided teachers with notebook computers and with CD-ROMs containing teaching materials. In addition, the Ministry launched special schemes for the schools and communities which are located on the remoter islands and in mountainous districts.

However, an even greater hurdle to overcome than geography was changing the mindset of teachers themselves so that they might use the courseware effectively and creatively. According to Bismillah Khatoon (2007), a common misconception among teachers was that using the courseware simply meant assigning a topic for students to learn or search. Thus, the teacher's role became largely that of a technician merely projected the courseware on the screen while students used the courseware without guidelines or teacher supervision. At the other extreme, some teachers claimed that teaching with the courseware provided required much more preparation time and effort than previously; hence the software remained securely in the box for these busy teachers. It can be seen then that there was a real need for appropriate preparation and training for all teachers of whatever persuasion, if the technologies were to be successfully integrated into classroom practice.

The Ministry of Education Malaysia adopted a system designed by Internexia, using as a guide the United Kingdom's Teacher Training Agency (TTA) specification. This system was software for teacher training to allow teachers to learn at their own pace, place and time. The software incorporated a tracking of learning and a self-assessment system, and also mapped the learning pathway for each teacher. Teachers were expected to complete the training in nine to 12 months at their own pace. On successful completion, teachers were to be awarded an internationally recognized certificate of competency. However, the Malaysian Ministry of Education required the training to be implemented through face-to-face instruction to accommodate the style of learning they believed was preferred by Malaysian teachers. The system was re-worked and the on-line program was reduced to a full-time, 10-day, face-to-face training course. The training program was launched in 2004 and the first phase was to be completed by mid-2007. The perceived advantages of the face-to-face training program were that there would be no distractions by day-to-day teaching activities, immediate tutorial support could be provided by the trainer, opportunities for collaborative work with fellow teachers were available, and feedback and quick evaluation of progress was possible. The disadvantages however were that the intensive face-to-face training did not allow time for teachers to absorb information other than at a superficial level

the lessons and teachers had to implement what they had learnt without provision of on-going support from the trainer. The schools, needless to say, also viewed the need to replace teachers while they were absent for the training as a disadvantage.

Recent studies carried out on the Smart School Concept innovation project, especially on the teaching and learning component of the project, have also revealed a number of additional difficulties. Siti Suria Salim & Sharifah Mohd. Nor (2005) in their study of the implementation of the Smart School approach in Selangor found that the lack of resources (particularly those relating to computers, teaching-learning materials and classroom size), shortcomings in teacher development, teachers' heavy workload, and the exam-oriented nature of the educational system were the major stumbling blocks which prevented teachers from successfully implementing the Smart School approach. Hajar Mohd. Nor (2005) in her study of the three pilot Smart Schools found that only one appeared to have integrated ICT into classroom teaching, with another showing signs of partial implementation and the third abandoning the process altogether. She also found teachers faced problems such as shortage of time, course content problems, and technical malfunction in implementing ICT integration in the MSS classrooms. Azizah Yaacob et al. (2005) in their study on the teaching and learning of English in Smart Schools found that although teachers and students expressed the desire to learn the smartway, their attempts were hindered by the limitation in infrastructure. Lee (2007) in his PhD thesis, found that the Smart School Continuing Professional Development (CPD) system seemed to succeed in raising the awareness of the English as a Second Language (ESL) teachers about the innovation but appeared less effective in equipping them with a clear understanding of the practices needed at the classroom level to implement change. Lee found that this was perceived to be due to lack of (a) time and opportunities to learn about the new curriculum, try it out in classrooms and reflect with colleagues on their own experiences and those of their students, (b) relevant training opportunities and continuity of teacher development, including an absence of in-service coaching in the school, and (c) ongoing commitment and support from departmental members and school administrators.

To ensure successful implementation of ICT in the classroom, the importance of a functional and system- appropriate infrastructure cannot be denied. But this is only the first step. Teachers need to be equipped with the necessary know-how and skills (skill sets) but also need to be active, enthusiastic, innovative and fully committed to embrace the new technologies (mind set). But the question is how might this transformation be achieved? To paraphrase an old saying, you can take a horse to water but if he's not thirsty you can't make him drink.

Mishra and Koehler (2006) build on Shulman's pedagogic content knowledge framework (1986, 1987) and suggest the successful implementation of technologies in the classroom needs a combination of technological, pedagogic and content knowledge or TPCK. This builds on Technological Pedagogical Knowledge (TPK) which is 'an understanding of how teaching and learning can change when particular technologies are used in particular ways. This includes knowing the pedagogical affordances and constraints of a range of technological tools as they relate to disciplinarily and developmentally appropriate pedagogical designs and strategies. To build (TPK) a deeper understanding of the constraints and affordances of technologies and the disciplinary contexts within which they function is needed.' (Koehler & Mishra 2009, p.65)

When TPK is combined with pedagogic content knowledge, i.e. TPCK, and knowledge of the school and the children this becomes a powerful tool to support teacher choice of appropriate technologies for enhancing learning. This provides a basis for understanding the evidence of low usage by teachers and impact on learning in classrooms in spite of investment in technologies in schools and in conventional training programmes in spite of investment in conventional training programmes (Cuban, Kirkpatrick and Peck 2001). TPCK suggests that learning how to use

technologies should directly involve interactions between those who understand the context for learning the best and that this is an evolving situated practice. This involves a culture shift in notions of what constitutes continuing professional development for teachers not only by those involved in teacher education and promoting technology use in schools but by the teachers themselves working with other teachers to share and acquire new knowledge and skills. Zhao and Frank (2003) suggest that teachers are more influenced in their technology use by their colleagues than large scale professional development due the constructive informal help they can provide alongside the challenge of peer group pressure. Green and Cifuentes (2008) provide evidence in a study with North American school librarians that online follow up, likened to coaching, improved articipants attitudes to the focus of the professional development. There was evidence of feelings of enhanced competence in the skills through the online participation and that the ongoing online work that addressed the area of professional practice deepened the participants' knowledge base. This study indicates that peer interaction is an important factor in making the task seems achievable. This is supported by a Delphi study by Clark (2006) that recommends time should be made available for teachers to work with each other to share and acquire new knowledge and skills to support the uptake of new technologies. Lock (2006) suggests this can be achieved in well designed teacher online communities focusing on ongoing professional needs of teachers built on trusting relationships. The notion is that the online mode would overcome the time and distance issues for teachers whose primary role is teaching in their classrooms. However there is a need for leadership and support in developing and sustaining this sharing (Harnell-Young 2006). There is some evidence that working with technologies themselves as part of professional development can impact on classroom practice but the relationship was more to do with teachers recognising the technology use was aligned with their beliefs about learning than simply developing confidence with the technologies (Windschitl and Sahl 2002).

In the light of the above the short face-to-face training courses like those offered by the Malaysian Ministry of Education are insufficient by themselves to provide the necessary spur to growth and practical support if teachers' learning is to take root. There is a need for teachers to be actively and strategically involved in ICT policy and practice from the outset in order for them to both 'own' and be able to impart the necessary skills to their students. In the following section the authors describe an in-service training intervention that involves teachers using new technologies in online communities to stimulate teachers' involvement, commitment and enthusiasm to embrace technologies as part of their teaching repertoire.

THE PROPOSED ON-LINE TEACHER TRAINING MODEL (e-CPDeIT: Model 2020)

In light of the apparent limitations of the current TED training program to bring about sustained change and innovation in technology use in Smart Schools, important questions remain to be answered. These questions are the drivers behind the current research project. The top-down, policy-led government ICT initiatives have failed to inspire the enthusiasm of ordinary teachers who have displayed a reluctance to change their teaching habits and routines to take on board the new technologies. The researchers propose a partnership model for online CPD for teachers of English, Mathematics and Sciences in improving their use of ICT in teaching. This model is loosely based on, (but adapted for use in the Malaysian educational context) the successful UK-based *Improving the Quality of Education for All* (IQEA) project (Ainscow et al 1994). IQEA was initially set up by a team of researchers at the University Of Cambridge Institute Of Education in the early 1990s during an era of frenetic educational reform in the UK. It was adopted by over 50 schools in the UK, as well as schools in South Africa, Hong Kong, Iceland and Puerto Rico. The IQEA model was posited on a fundamental assumption that school development and the professional development of its teachers must go hand-in-hand. The overall aim of the university-based project was to 'produce and evaluate a model of school development and a program of

support that strengthens a school's ability to provide quality education for all its pupils building on existing good practice' (Ainscow et al 1994, p.5).
The team also argued that external drivers for school reform must be linked to the developmental aspirations of the school itself and if these are out of alignment then change is unlikely to occur. With this in mind, the current eCPDelT project, which is also HE-based, has closely aligned its goals with the objectives of the Malaysian government's Vision 2020, which seeks to implement learner-centered approaches to e-learning within and without all smart schools. Smart schools have been chosen by the government as the cornerstone to the success of Vision 2020 as teachers in these schools have already received significant government funding to improve their technology infrastructure and some teacher training in ICT. It is these teachers who now face the considerable challenge of implementing government policy with little or no ongoing professional support while under the watchful gaze of the public eye. It is these teachers that the eCPDelT project aims to support.

The eCPDelT: Model 2020 is currently being piloted in five Smart schools in the region around Malaysia's capital, Kuala Lumpur, involving some 20 teachers. As mentioned earlier, the eCPDelT model draws on the legacy of the research findings, principles and practices of the IQEA model but has been modified and adapted for the Malaysian educational and cultural context. In the IQEA model, at the institutional level, schools are required to form a group or 'cadre', (usually around 3-6) comprising staff in a range of institutional roles, experience, age and subject discipline. It is the cadre which is expected to drive the quality agenda and set the pace for development in teaching and learning. It is expected that the head teacher will be a member of the cadre in order to show the full force of institutional backing for its work. Their task is to work together to identify challenges for improvement and harness the energies of all colleagues to bring about the desired changes in their schools. This is done by primarily reflecting on and sharing their teaching practices which include exploring teaching models and examining which practices are effective and which are not (Hopkins et al 1996). The overall aim of IQEA is strengthening the schools' ability to provide quality education by building on existing good practices. In this model the propositions for school improvement include:

1) teachers collaborate in order to develop individually and collectively ;
2) key stakeholders are involved and external pressures for change will be linked to school agendas for improvement
3) there is a shared vision for school development and leadership is seen as a distributed function
4) there is on-going communication among teachers related to vision, values and aspirations around improving the quality of teaching and learning;
5) enquiry as a form of action research and reflection are recognised as important processes, and
6) educational aspirations are closely linked to classroom practice (Hopkins et al., 1994).

School improvement therefore fundamentally involves the process of change and transformation. However it is not change for change's sake but to improve the quality of the learning and teaching which students receive. It has been demonstrated consistently that teacher development is an indispensable part of school improvement (Hopkins et al 1996) and that for school improvement to occur, teachers need to be committed to the process of change which will involve them in examining and changing their own practice (Harris 2002). This is undoubtedly an emotional challenge for some teachers if it is seen as a threat to their sense of identity and self-worth as a teacher. Day (1999) emphasizes that teachers will only be able to accomplish their educational

purposes if they are both well-prepared for the profession (initial teacher education) and are able to maintain and improve their contributions to it through career-long learning (CPD). Support for the professional development is therefore an integral part of efforts to raise standards of teaching, learning and achievement and higher education (HE) has an important role to play in providing this support. He also emphasizes the importance of teachers being directly involved in any decisions regarding the direction and process of their own learning, so CPD becomes a negotiation of mutual professional interests rather than an management imposition. In the IQEA model concept was to affect change at all levels of school organization and this is shown in the figure below.

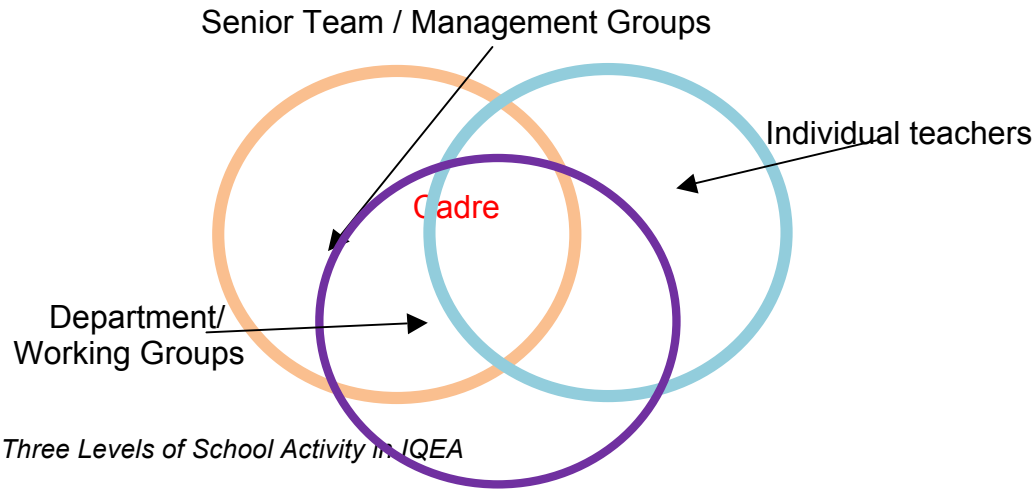

Figure 1: *Three Levels of School Activity in IQEA*

In the study reported here, the role of the university-based research team was to be the half of the partnership which provided a program of staff development events and a mentor or adviser linked to each school. For this project, action research is identified as a methodology best suited to bring about the required organizational and behavioural change. The project team draws on and adapts the Continuous Professional Development (CPD) hub and spoke model based on a critical relationship between a number of school-based cadre of change–agents (spokes) and a Higher Education Institutions (HEI)-based research team (hub). Figure 2 illustrates the CPD hub and spoke model used in this project.

In the eCPDeIT project, the spokes are made up of five schools with four teachers (of English, Mathematics and Science) from each school and the hub comprises the researchers from three universities: two Malaysian public universities and an established University in England.

One of the main criteria identified by the project team for the success of the Smart schools is that the teachers should undergo intensive training in the use of information technology so that they can integrate it into classroom activities to enhance thinking and creativity. Therefore, the four phases in this research are: (1) Problem identification needs analysis and goal setting, (2) design of the new system, (3) development of the new system, and (4) implementation of the system and dissemination of research findings. The HEI research team brings together the school-based cadres to share emerging issues, themes and evaluation as well as form the basis for what will be called the “SMART School Champion’s Club”, i.e. school-based practitioners who develop expertise in managing change in their own institutions and beyond.

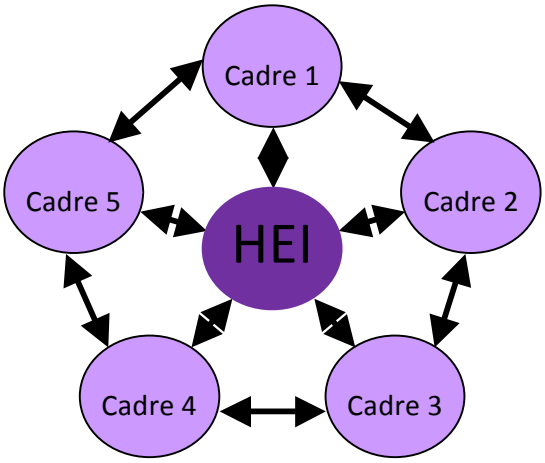

Figure 2: *The CPD hub and spoke model in e-CPDeIT): model 2020*

The online model proposed (e-CPDeIT: Model 2020) differs from the IQEA in two very important aspects. The sharing in the case of the IQEA was mostly face-to-face whereas in the present study the sharing between the teachers will be done online and the tool to be used for sharing classroom practice, the ViP (Virtual interactive Platform), is described in the following section. Second, the goal of the proposed project extends beyond bringing about changes in teaching and learning. It extends to giving teachers an opportunity to work with ICT from the outset so that they are aware of all the problems involved when they attempt to impart the skills to their students.

STAGES IN THE METHODOLOGICAL APPROACH ADOPTED IN THE eCPDeIT PROJECT

The following are indicative stages in the methodological approach which is based on developing the research team's understanding and ownership of a model for developing each of Smart school's involvement in the project, capacity for change and their competence in sharing their learning with other schools.

Phase 1- Problem Identification, Needs Analysis and Goal Setting

1. Conduct a meta-analysis of the literature related to Smart school developments within Malaysia and elsewhere with a particular focus on effective CPD models.
2. Identify and invite representative Smart Schools to form research cadres and become case study schools
3. Introduce the aims of the project, university research personnel to the school cadres. Conduct a workshop for all project school teachers involved to present to them the partnership CPD model and detail what involvement in the project would entail in order to make informed choices about participation.
4. Develop a procedure to benchmark the ICT use of English Language teachers and their senior managers in the selected schools through face-to-face semi-structured interviews and questionnaires.

Phase 2 – Design of the New System

5. Through preliminary research findings, explore understandings of teachers' perspectives of effective practice and develop such practices within and between Smart school cadres. Integrate an online resource to support change within and beyond the individual research cadres by establishing a technical team and the infrastructure to capture and share effective classroom practice and professional development activities. The establishment of these on-line communities of practice will be enhanced by sharing exemplars of what is considered to be effective teaching. This will be accomplished by (a) sharing text-based narratives of perceived good lessons through blogs (b) sharing of video clips of good lessons through the ViP (c) forum discussions of lessons, and d) online discussions with HE–based moderators through forum, emails and chatrooms. Face-to-face training workshops will be held to support the program of activities, the development of the communities and to provide training in the use of the technologies.

Phases 3 and 4 – Development of the new system, implementation and dissemination.

6. Develop and support a CPD program in partnership with Smart School English Language teachers and senior managers.
7. Capture digital examples (video, audio and text) of the development of effective classroom practice.Share these with the Smart School English Language teachers as part of the CPD process to support their development and learning.
8. Produce and share research findings with teachers in the project schools, at academic research conferences and wider dissemination of the e-CPDelT: Model 2020.
9. In partnership with the project teachers, support the sharing of the research findings and recommendations for future practice at in-service events in schools.

THE ViP AS AN ENABLING TOOL FOR TEACHER DEVELOPMENT

Research has shown that making reflective videos can benefit teachers who want to reflect deeply on their current practice (Barton & Haydn 2006; Gebhard 2005). Sharing exemplars of on-line communities of practice in this project will be accomplished by (a) sharing text-based narratives of perceived good lessons through blogs (b) sharing of video clips of good lessons through the ViP (Virtual interactive Platform) and (c) forum discussions of lessons, and d) online discussions with HE –based moderators through forum, emails and chatrooms. Special mention must be made of the Virtual interactive Platform (ViP) as this technological tool was developed by one of the authors (Joyes) and colleagues at the University of Nottingham specifically to support teacher professional development. The ViP allows users to upload video to the ViP server and construct a text-based narrative around this. It allows distributed or at a distance learners to share their own 'home made' video footage of classroom events or episodes with whomsoever they choose. This can then be used as a prompt or aid to developing a more profound understanding of the dynamics, processes and values which imbue pedagogical routines, by inviting the video author to provide a personal commentary and reflection of the videoed episodes. This is particularly useful in the sharing of a video of a classroom episode because the teacher can add their own metacommentary, describing the particular aspects of practice being shown; outlining the aims of the lesson, the rationale for the approach, the strategies used and so on.

This is achieved in the ViP through a facility for the 'owner' of the video material to add text commentaries to their uploaded video which are then highlighted when the video is played. This transforms the video into an analytic tool. The narrative itself, which is a reflection upon the video

content, thus becomes a vehicle for critical reflection. Other resources such as lesson plans, worksheets, and examples of students' work can also be added to add depth and texture to the narrative stream. Importantly the 'owner' can select to keep their video private, share it within a small learning group or make this openly available to others. This facility ensures privacy when sharing videos of students within a classroom setting.

Using the ViP tool, the video owner, in this case a teacher in the e-CPDeIT project cohort, can create their own learning group, for example members of their cadre or subject group, and then invite group members to add their own thoughts and reflections in the discussion forum. In this way multiple perspectives can be shared and discussion enriched. This is achieved through a text-based discussion around the video in which a group member can select and link to one or more video clip from a variety of video sources within the ViP (see figure 3).

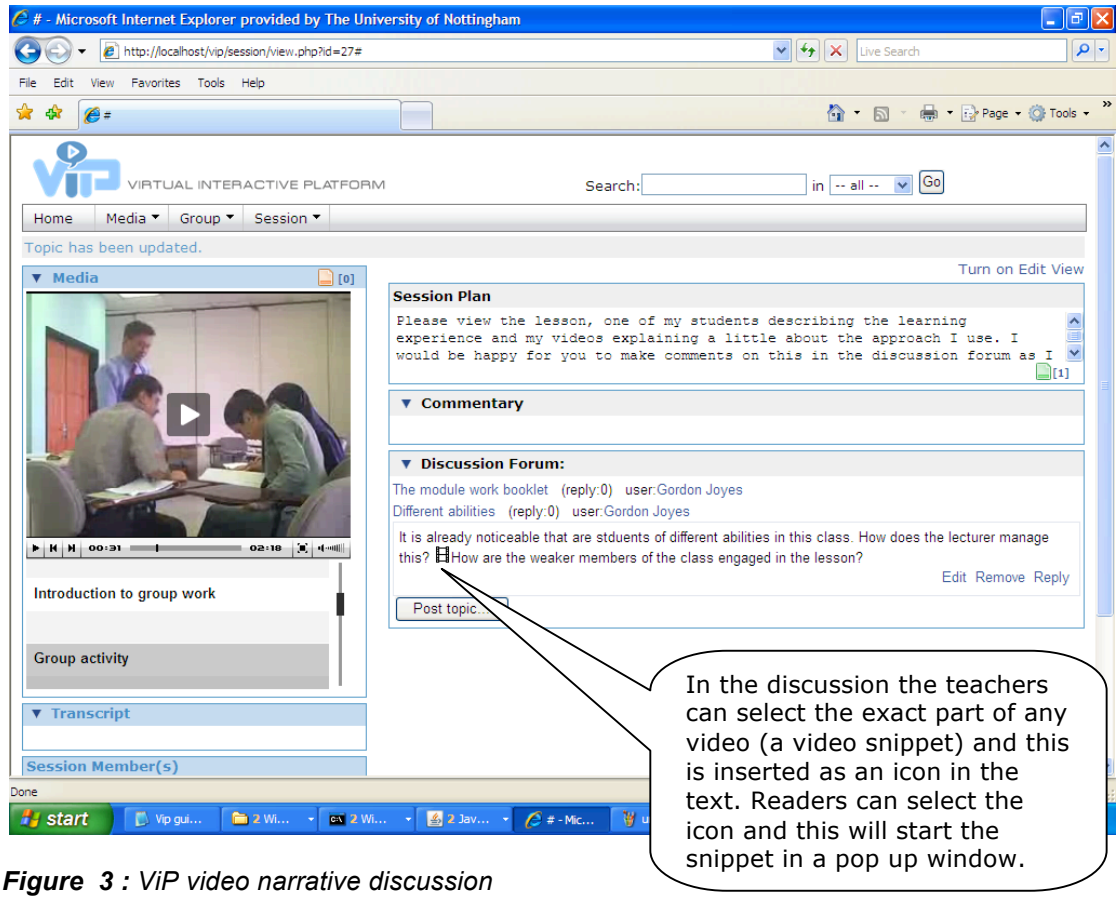

Figure 3 : *ViP video narrative discussion*

Bearing in mind time demands on teachers on the project, we realized that discussion time around video can be onerous, particularly if the video footage is extended or there are a large number of clips to discuss. So the selection and linking facility within a discussion post has been designed to support the exploration and analysis of the video content in depth. So for example, if a video of a classroom episode was under analysis, the discussion posting might want to focus on strategies the teacher was using to engage the students in the group discussion. In the post they could refer to strategies within any part of the text and place a video link icon that would take

the viewer to the precise location in a video clip where the strategy was being demonstrated. Additional video links can be added to illustrate the strategy working in other contexts and of course more footage of ways to encourage student discussion can be added by other members of the learning group.

For the eCPDeIT project the participating teachers are requested to upload selected video clips of a lesson where they had integrated the use of ICT. These clips may highlight successful or problematic use of IT as perceived by the teachers themselves. These 'excerpts' are then discussed among the online community or cadre in subject groups.

CONCLUSION

Through the pilot project it is anticipated that a robust model for supporting teachers in their take up and use of ICT in the classroom will be developed. However as we had argued, addressing extrinsic factors such as providing infrastructure and kit alone is insufficient to change teachers' habitual teaching and learning practices. As importantly, the motivational and psychological issues in relation to prompting lasting changes in teachers' attitudes and behaviors in relation to ICT need to be considered. This research sets out to investigate if the proposed e-CPDeIT Model 2020 project as envisioned has the potential to change the minds and hearts, as well as the practice of project teachers, so that the rich potential of the ICT which has been provided in their classrooms can be put to optimal use. It is anticipated that teachers engaged in the project will not only develop a better understanding of their own teaching but also drive the change agenda their schools and be able to utilize ICT effectively in order to enrich teaching and learning.

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