

The utilization and integration of ICT tools in promoting English language teaching and learning: Reflections from English option teachers in Kuala Langat District, Malaysia

Robinson Joseph Samuel
Retired College Lecturer, Malaysia

Zaitun Abu Bakar
University of Malaya, Malaysia

ABSTRACT

The unprecedented advances in interactivity and multimedia capabilities together with a myriad of emerging technologies have enabled the creation of virtual learning environments that could be utilized to boost the development of English language skills among Malaysian primary and secondary school students. English language standards have been deteriorating over the years and basic oral skills have been appalling due to lack of usage and reflective practice. English lessons that incorporate multimedia applications can exert powerful motivation and provide bored students with exciting new ways to learn. The utilization and integration of ICT tools can indeed assist students in acquiring English Language competency as well as enhance the quality of their learning experience. This paper first examines the present scenario of English language teachers as regards ICT integration and tries to determine if ICT skills of English language teachers in the light of existing infrastructure facilities are adequate to promote English language teaching and learning. The researchers next look at some of the obstacles faced by English language teachers in ICT integration and finally in the concluding part the researchers suggest the use of interactive lessons to speed up the teaching and learning of English.

Keywords: *interactivity, multimedia elements, rich learning environment*

INTRODUCTION

There is growing concern about the level of English proficiency at the workplace which if left unchecked could lead to the country losing its competitiveness especially in the industry and technical fields. Malaysia needs communicative competence to maintain its competitive edge in all aspects of our economic environment be it administration, education, trade or finance. The 2004 School Certificate Examination Report on English Language 2 revealed that the majority of the candidates have yet to master the writing skills in English (Laporan Prestasi SPM, 2004). What is amiss? Can the right ICT tools enhance English language teaching and learning and quickly arrest the rapid decline? ICT tools have now removed the time and space limitation found in traditional teaching. Classroom dialogue can now extend beyond the time and space constraints of class time (Frayer, 1997). Carmen et al., (2003) say that integrating ICT tools in teaching can lead to increased students' learning competencies and increased opportunities for communication. Key findings under ImpaCT2 (www.becta.org.uk) show that the use of ICT tools in teaching and learning has positive effects on behaviour, motivation, communication and process skills and that it enables pupils to learn more autonomously. ImpaCT2 further shows that teachers in schools where pupils used ICT in English achieved higher mean gain scores. The integration of ICT tools in the teaching and learning of English have found to bring other benefits too. Besides motivating pupils and raising self-esteem and confidence, ICT can enhance pupil interaction, verbalization and involvement in collaborative learning (SIIA Report – 2000). What is the scenario on the utilization and integration of ICT tools among English option teachers in

Malaysia? Can similar benefits be achieved here in Malaysia? In order to answer these questions a qualitative study was carried out to find out the extent of ICT integration among 30 English language teachers in Kuala Langat District in Selangor.

METHODOLOGY

The sampling frame of study was primary and secondary school teachers in three premier schools in Banting. Over a period of six months (i.e., July to December 2005), the researchers conducted face-to-face, semi-structured interviews with 30 trained teachers from three schools namely Sekolah Kebangsaan Sri Langat, Sekolah Menengah Kebangsaan Teluk, Panglima Garang and Sekolah Menengah Sultan Abdul Samad, Banting. Prior to the interviews, the researchers visited the above three schools and obtained useful information pertaining to infrastructure facilities. Each school has 2 computer laboratories with 25 desktop computers in each lab that are networked to a central server. Broadband internet access in the form of School-Net is available. Printing facilities are only available for teachers. Besides these, each school has on an average 19 notebooks and 10 LCDs and display screens.

Seven interview questions brought a wealth of information which the researchers have consolidated into one research article. The seven interview questions that were asked are as follows:

- Are there adequate infrastructure facilities in your school to support ICT integrated activities?
If adequate, please mention the facilities.
If inadequate, please mention facilities that are lacking.
- If infrastructure facilities are improved would you carry out more ICT integrated activities?
- Have you conducted ICT integrated lessons in 2005?
If yes, mention the tools used.
- Have you attended any computer course before?
Please give details.
- Do you possess sufficient ICT skills to confidently carry out ICT integrated activities in class?
If the answer is negative, please mention the skills that you need.
- What obstacles do you face in carrying out ICT integrated teaching and learning activities?
- Is the school administration supportive in your endeavour to utilize and integrate ICT tools in teaching and learning activities?

The researchers chose the above three schools in Kuala Langat District in Banting on the basis of accessibility. The district education officer located in Banting is familiar with one of the researchers and hence it was not a hassle to obtain permission to interview and observe the English option teachers in these three schools. However, prior written permission from the District Education Officer was still necessary. Semi-structured, face-to-face interviewing was chosen as it was found to be the most appropriate strategy because of the intense nature of the topic under scrutiny. Semi-structured interviews are formal verbal questionnaires and they comprise a series of questions designed to elicit specific answers on the part of the respondents (Fraenkel & Wallen, 2000). Real-life examples provide illustrative evidence rather than the basis for testing hypothetical deductions needed in the formation of theory (Sirotnik, 1989). Each interview with the selected respondent was scheduled to last approximately one hour to allow a thorough examination of the ICT tools used in the teaching and learning of English. The interviews were carried out using a set of open-ended questions that were organized into a questionnaire. Time was further spent on observing how the respondents carried out their daily routine teaching and learning activities in the class. The interviews were recorded and later transcribed.

RESULTS

The seventeen themes that emerged from the responses to the seven interview questions are tabulated in Table 1. The researchers have classified the seventeen themes into six areas for further consideration.

Table 1: Respondent Themes

No	Area	Respondent Theme
1	Infrastructure Facilities	<ul style="list-style-type: none"> ▪ Insufficient computer laboratories and poor maintenance. ▪ Desktop computers installed with archaic operating systems. ▪ SchoolNet (Broadband) connection often erratic ▪ No central database - still file processing system is used. Server shutdown after 'school hours'. ▪ No Learning Management System used. Smart School Management System (SSMS) still in testing stage. ▪ Computer facilities for teachers – limited; many PCs and Notebook computers are not functioning well
2	Computer Courses	<ul style="list-style-type: none"> ▪ Insufficient courses and training ▪ Many have not attended any computer course at all
3	ICT Skills of Teachers	<ul style="list-style-type: none"> ▪ Generally poor ▪ Request for more training
4	ICT Integrated lessons	<ul style="list-style-type: none"> ▪ ICT integration rarely carried out ▪ Teachers are generally ignorant of ICT integrated and interactive lessons and quizzes in the web.
5	Supply of Courseware by MoE	<ul style="list-style-type: none"> ▪ Many CD-ROMs have been supplied but rarely used by teachers
6	Obstacles	<ul style="list-style-type: none"> ▪ Laboratory coordinator not skillful in solving simple PC problems. ▪ Poor support from school administrators ▪ Negative attitude of teachers ▪ Administrative burden – many tasks still manual

Infrastructure Facilities

Insufficient Computer Laboratories and Poor Maintenance

Almost all the respondents indicated that the computer laboratories in the school are inadequate. Presently, there are two computer laboratories which have networking facilities and are connected to a central school server. This means that at any one time only two classes can carry out ICT integrated activities. The computer labs are heavily booked and many teachers get frustrated for not being able to gain access to the computer laboratories. What is more alarming is

the fact that out of the 25 desktop computers in each lab only 15 of them are in proper working condition. As one SK Sri Langat teacher stated,

Everytime I on the computers in the lab, it hangs and it takes hell-of-a long time to come back to its normal operating mode.

Maintenance is poor and allocation of funds from the Ministry of Education is rather slow. On the question of increased ICT integration with improved infrastructure facilities, two-thirds of the informants said that they were not sure and another one-third were reluctant to comment on this matter. Two comments supported this perception:

I'm not sure at this point of time. I face many constraints... I don't like to say anything on this matter.

Desktop Computers Installed with Archaic Operating Systems

Approximately two-thirds of the informants specifically mentioned that 10 computers in each lab have been installed with Windows 98 Operating System. The implication of this is that the CD-ROMs supplied by the Technology Division of the Ministry of Education cannot be 'opened or run' as the programmes contained in the CD-ROMs have been made using Windows 2000 operating system. The number of English multimedia teaching-learning materials in the form of CD-ROMs developed by the Educational Technology Division and 'Syarikat Telekom Smart School Sdn. Bhd.' and distributed to the 88 existing Smart Schools is shown in Table 2.

Table 2: Teaching Learning Materials

(Educational Technology Division Report, 8th March 2004 – <http://www.moe.edu.my>).

Subject	Percentage of Syllabus Covered	Number of Software Produced
English Language	80%	408

If this sample is taken to be representative of a typical school, then this revelation indicates that the multimedia CD-ROMs which contain interesting and interactive English lessons are not being used by hundreds of schools and they become white elephants and just being stored in steel cabinets. One SMK Sultan Abdul Samad teacher spoke candidly, *I tried to open the CD-ROMs but in vain. I'm fed-up.* What a waste! Some allocation of funds is necessary where the school administrator could use his discretion to repair or change the operating system quickly without adhering to bureaucratic procedures.

SchoolNet (Broadband) connection often erratic

One-fourth of the informants asserted that the broadband access is not consistent and on certain days there is no internet service. The school servers are frequently attacked by virus and there is a need for GITN Sdn. Berhad (Government Integrated Telecommunications Network) to block the virus before they enter SchoolNet. In addition to this, the existing cabling and wiring cannot take the full load of electricity when all the computers are on at the same time. One Sri Langat teacher commented, *Very often the SchoolNet is down. I'm fed-up with the quality of their service.*

No central database

All the informants noted an absence of a central database in their schools. The establishment of a database is vital where all data is integrated and stored. All departments can access the information in a database according to their needs. Students with low English proficiency could be identified in a split second and remedial measures could be initiated. One-third of the respondents say that their computer laboratories are not networked to a central server. This is quite a sizable number and this means the potential gains that can be derived from a school

intranet have not been exploited. What is even worse is that the school servers are shutdown after school hours and therefore the servers only play a limited role. If a school has developed a range of resources based on a particular theme, then there may be many opportunities for that content to be shared with other schools through intranets (Heppell, 1999). Almost all the responses noted that 'File Processing System' is still widely practiced in all the three schools. Teachers store their data either in diskettes or in 'thumb drives'. Every time a department official wants information about teachers, he sends a form to schools and asks teachers to fill in their particulars. The Ministry officials can easily extract information about teachers if there is a central database. Teachers frequently complain that they have to fill in their personal particulars several times in a year. The following views exemplify these feelings,

I am fed-up of filling up my particulars so many times in a year.

No Learning Management System

On the use of Learning Management System, virtually all the informants noted that they have not used a Learning Management System before. This indication is not a healthy sign as a LMS can not only help to reduce the administrative burden of teachers but it can help to monitor and track the individual progress of students. Besides these functions, a typical LMS has special classroom features such as discussion forums, calendars, and "chat rooms" where participants can communicate in real time with each other. Currently only about 50 'Smart Schools' are using the Smart School Management System (The Smart School Bulletin, 2005). The SSMS has four main modules namely the Attendance, Lesson, Co-curriculum and Timetable modules. There is a dire need then to extend the SSMS to all primary and secondary schools in the country. The automated functions in SSMS can help to reduce the administrative burden of teachers. One teacher in SMK Sultan Abdul Samad explained,

I've to manually arrange lots of data. I wish my school had adopted the SSMS.

Limited Computer Facilities for Teachers

Almost one half of the respondents specified that only limited computers are allocated for the staff to use. The teachers added that due to this limitation, they find it rather difficult to prepare examination questions and prepare reports. A teacher in Sekolah Menengah Sultan Ahmad Samad lamented,

Every time I want to use the school computer, somebody is using it. I don't get a chance to use.

All the informants contented that there are many desktop and notebook computers in the schools. However, many of the PCs and notebooks are out-of-order.

My school has 19 notebook computers but when a teacher wants to attend a course and needs to bring along a notebook, it is extremely difficult to find one. 12 of the notebook computers are out-of-order. I virtually have to beg to obtain a computer which is in proper working condition.

Computer Courses

Insufficient courses and training

Teachers are currently being given a two week course on ICT integration in teaching and learning. This course which is known as BPPT (Bimbingan Perguruan Profesional dalam Teknologi Maklumat dan Komunikasi) is a nation-wide project held in 90 centres (www.bppt.com.my). Besides the BPPT course, the Local District Education Officials do organize a three day basic computer course for teachers. Though these courses are available, it is difficult to get selected as many teachers want to attend. One SK Sri Langat teacher lamented,

I hope I'd be selected for the 10 days computer course in the near future.

Many have not attended any computer course at all

Two-thirds of the respondents said that a large majority of teachers especially the senior ones have not attended any computer courses at all. The opportunities to attend computer courses are there but however for some rhyme or reason, the senior teachers avoid going by directing other younger teachers to go. They are either afraid or fearful of being ridiculed by fellow teachers of being incompetent. Two comments supported this perception.

My fingers are stiff and I don't like to use computers.... Let the young people learn computers. It is of no use to me.

ICT Skills of Teachers**ICT skills generally poor**

Almost two-thirds of the respondents acknowledged that their ICT skills are generally poor. Some of the poignant responses were in this area.

I am familiar with MS Word and surfing the internet but when it comes to using Excel, PowerPoint and the scanning machine, I am at a lost. I've to seek help from my friends. Sometimes my friends sulk when I ask them simple ICT questions.

Request for more training

The bulk of the respondents suggested that appropriate skills training on the use of MS Word, MS Excel and MS PowerPoint be given to all teachers at an on-going basis. Those who have mastered the basic skills should be given opportunities to go for more advanced training. One SK Sri Langat teacher spoke candidly,

Please give me training and I can perform. How do you expect me to integrate ICT tools in teaching and learning activities when you don't train me?

ICT Integrated Lessons**ICT integration rarely carried out**

Under the BPPT Project (www.bppt.com.my), as of 31st December 2005, 40,231 teachers in Malaysia have been trained on appropriate ways of integrating ICT tools in teaching and learning activities in the classroom. Out of this total, 3699 teachers are English option teachers and these teachers have been professionally trained by master trainers appointed by the Prestariang Sdn. Bhd., an outsourced private company stationed in Cyberjaya. Approximately two-thirds of the informants specifically indicated that after having gone through the intensive 10 days training on ICT integration, they are aware of the benefits and now know how to integrate ICT tools in teaching and learning activities but unfortunately they are unable to carry out ICT integrated lessons in class. Too many constraints hamper them in this crucial task of ICT integration in teaching and learning activities. The following views exemplify their feelings.

I know ICT tools can motivate pupils and help in better understanding of concepts but I can't conduct an ICT integrated lesson because many of the computers in the computer laboratory are not in proper working condition... I have no time and I've to finish my syllabus...I've too many classes to handle and right now I can't think of ICT integration... I've too many administrative tasks to complete.

Overall only one-tenth (i.e., 10%) of the informants admitted that they did carry out ICT integrated activities three times in a year. This is a big let-down but however at least a few teachers are still keeping the 'torch of ICT integration' burning.

Teachers are generally ignorant of ICT integrated and interactive lessons and quizzes in the web

There are hundreds of websites that have been created to assist in the teaching and learning of English. In fact there are many 'self-exercises' in the internet. English Exercises Online at <http://www.smic.be/smic5022/> has over 100 free exercises. They cover vocabulary, grammar and reading comprehension. For an interactive lesson with a real teacher one can visit <http://eslgo.com/>. At this site a student can learn English as a second language (ESL) with an ESL teacher. In spite of the existence of numerous useful websites, one-third of the informants were ignorant of the existence of interactive and ICT integrated English lessons in the World Wide Web. A teacher from SMK Telok Panglima Garang explained,

I didn't know that there are free websites for students to listen to poems and popular stories.

Supply of Courseware by Technology Division, Ministry of Education (MoE)**Many CD-ROMs have been supplied but rarely used by teachers**

Besides the resources available in the Internet, there is a wealth of materials in the form of CD-ROMs available to English teachers. Hundreds of CD-ROMs are sent not only to the Smart schools but to almost all the 10,000 schools in East and West Malaysia. Many of the CD-ROMs have interactive English lessons but somehow only one-third of the respondents acknowledge that they use these resources once a while. Two-thirds of the informants have kept away due to lack of time while five teachers were ignorant of these valuable resources.

I don't have enough time to go through the CD-ROMs supplied by the Ministry of Education.

Obstacles**Laboratory coordinators not skillful in solving simple PC problems**

Very often computers in the school laboratories do not function properly. When a computer malfunctions, the problem may be a small one and can normally be put right by a person with elementary computer repair knowledge. Two-thirds of the respondents noted that lack of computer repair and maintenance skills prevent the coordinators from carrying out minor repairs and as a result many of the computers became unusable due to lack of funds for repairs. Allocation of funds for repair takes a long time to be approved. The reason that several teachers do not take their classes to the computer laboratories is that

In SK Sri Langat, only 10 out of a total of 25 computers in the lab are usable. Imagine 10 computers being shared by 40 students. The class becomes noisy. I prefer not to take my pupils to the lab.

Poor support from school administrators

The success of ICT integration in teaching and learning activities to a large extent is dependent on the support given by the school headmaster or principal. Two-thirds of the responses noted negative experiences in relation to support from the Head teacher. One SMK Telok Panglima Garang teacher commented,

My headmaster is more concerned about the examination results rather than ICT integration. Another explained, My principal all the time talks about better grades in the school assembly. He doesn't repair computers which are out-of-order.

Negative attitude of teachers

Negative attitude of teachers could act as a stumbling block to greater use of ICT resources in the teaching and learning of English. One fifth of the informants complained that they have inadequate skills and insufficient infrastructure facilities to think about ICT integration. They asserted that it is too difficult for them to integrate ICT tools in teaching and learning activities. The following views exemplify their negative attitudes.

Let those who are clever in ICT do the integration...I don't care. I am too old for ICT integration.

Administrative burden – many tasks are still manual

The administrative burden of teachers has been the bane of teachers in general. In this information era where automated functions are the order of the day, there are still many tasks in schools which are done manually. Preparation of Report Cards, making attendance summaries and filling the Record Book are some of the administrative tasks which wear down the over-worked teacher. Some of the distressing responses were from this area.

I feel tired of filling up forms and writing the Record book...The administrative task sometimes eat into my teaching time. I'm bogged down by administrative work... I wish I could spend more time on teaching rather than doing administrative duties.

DISCUSSION

Almost all the teachers cited lack of ICT resources and infrastructure facilities in schools as the most common reason that impedes the integration of ICT tools in the teaching and learning of English. Computers in fact are available in school for teachers and pupils but the interview findings revealed that many of them are out of order. This is a serious problem and repair facilities are slow. Experience has shown that a notebook owned by the school tend to breakdown faster than one which is owned by an individual. This could probably be due to 'many hands' using a particular notebook and therefore the 'wear and tear' are much greater. It is suggested that it is better for the individual teacher to buy his or her own notebook. The personal possession of a computer may well be the single most important factor enabling a teacher to integrate ICT into their professional practice (Dawes, 2000). It is sad to note that some schools still used Windows 98 Operation System. It is suggested that computers with Windows 98 Operation System should be quickly reinstalled with the latest Windows XP Operating System. However, caution should be exercised by ensuring that only original softwares are purchased and installed. Many urban schools at this point of time have already been equipped with ultra-modern IT facilities. However, computer infrastructure facilities in hundreds of rural schools are still at the bare minimum. Many still do not have proper computer laboratories and those that were built were not done to specifications. According to a Works Ministry Report published in the New Straits Times dated 17th May 2004, out of the 400 computer laboratories which were found to be incomplete or unsafe, only 100 of them have been repaired so far.

Extending broadband facilities is another teething problem that should be urgently looked into as transfer of data and graphics through normal telephone dial-up services are rather slow. School-Net connection has never been smooth and therefore GITN, the service provider for broadband School-Net ought to be improved if we want more teachers to carry out ICT integration. The interviews glaringly revealed the absence of a central database for either the teachers or the pupils. The establishment of a central database is vital in obtaining quick and fast retrieval of data. Having now realized the importance of a central database, the Ministry of Education as of 3rd January 2006 has introduced three different database systems namely SMM for pupils, EMISP for teachers and PREST2K for teacher evaluation (<http://www.moe.my>). Personal details

of all pupils and teachers in a district are entered into these systems. There has been a lag in the implementation of the Smart School Management System. The SSMS which has been implemented only in the 'Smart Schools' should be extended to cover all the 10,000 primary and secondary schools in the country.

The most revealing finding came from the ICT integrated lessons area. Out of a total of 30 teachers interviewed, only 3 teachers admitted that they have integrated ICT tools in the teaching and learning of English. The others frankly said that they were too many obstacles on their way. One Sri Langat teacher commented, *I have 28 periods and I just don't have the time to plan and implement an ICT integrated lesson.* Another frequent complaint of teachers is the lack of opportunities for training in ICT skills. Training in ICT skills is crucial in implementing ICT integration in the teaching and learning of English. As more teachers become competent in the use of basic ICT tools, there would be more ICT integrated activities in the classroom. This would give a boost to English language teaching and learning. The interviews with English option teachers confirmed the view that the three teachers who integrated ICT tools in the teaching and learning of English have advance ICT skills. 'The extent to which teachers are given time and access to pertinent training to use computers to support learning plays a major role in determining whether or not technology has a positive impact on achievement. Students of teachers with more than ten hours of training significantly outperformed students whose teachers had five or fewer hours of training' (Valdez, 2000). Computer skills training should be provided on an ongoing basis as new software and hardware are introduced. Interim findings from ImpaCT2 indicate that even experienced teachers may find it challenging to integrate ICT into their teaching if they are unfamiliar with software and hardware (ImpaCT2, 2001).

The respondents were vocal in voicing their personal problems and obstacles. These are listed below:

- Lack of support from the school administrators
- Exam pressure and fear of not being able to complete the syllabus.
- Inadequate trolleys to house the LCD in the classrooms
- Long waiting list to use the computer laboratories.
- Over-burdened with administrative tasks
- School servers are not maintained and riddled with all kinds of 'stubborn' virus.
- No supervision on ICT integration by school administrators
- Absence of any kind of school management system in most schools
- Negative attitude of some teachers

The Government is continuously sending more and more teachers for training in ICT skills and providing better infrastructure facilities. Computer laboratory coordinators too have been sent for training in server set-up and networking skills. Interviews with local education officers confirmed these developments. Recent figures released by the Ministry of Education show that 4,500 schools are already equipped with computer laboratories, 99,000 computer units and 4,600 servers. A total of 8,120 schools are connected to the broadband School-Net and a total of 97,000 laptops and 70,000 LCD projectors have been supplied to teachers teaching core subjects (Smart School Bulletin, 2005). The above information augurs well for boosting ICT integration in English language teaching and learning.

CONCLUSION

The informants' responses did provide an insight into the impediments that teachers face pertaining to ICT integration in the teaching and learning of English language. This study has demonstrated that lack of infrastructure facilities is but one of the many causes for poor ICT integration. Several of the informants stated in confidence that even if the infrastructure facilities were to be increased, the situation would not change. What is more alarming is the fact that even after having gone through a 10 day course on ways of integrating ICT tools in the teaching and learning of English, the teachers are not carrying out ICT integration. What is amiss? The interviews suggest that there are far more serious and more complex issues to address. The ICT skills of teachers need to be addressed first. In-house training on ICT skills should be intensified in all schools. Some of the obstacles like the administrative burden need to be seriously addressed. Adequate infrastructure facilities and resources would of course provide a learning climate and environment rich in authentic interaction. Findings have shown that schools which have very good ICT resources achieved better results in English than schools with poor ICT (Becta Report, 2001). However, it is not practical to keep on increasing the number of computer laboratories in the schools. A possible solution would be to fix an LCD and computer with broadband wireless access in a few selected English language classrooms on a permanent basis. In this way, teachers could avoid pushing around the trolleys that house the computer set in and out of the classroom. Presently, the teachers vehemently complain that the trolley wheels are broken and therefore they could not bring the computer set to the classroom.

Another pertinent issue is the indifferent attitude of the teachers. This should be seriously looked into if any integration is to be implemented. Teachers do go for the ICT integration courses and complete it successfully and it appears to end there. Once back in school, the teachers tend to adhere to in their traditional ways of teaching. A sense of commitment and dedication on the part of the teachers is necessary. Close observations by the researchers have mirrored the fact that ICT skills gained at courses are being used to the maximum to further the participants' qualifications but they are not being used to improve their presentation skills for the benefit of pupils. The school administrator, the Education Department and school inspectorate should therefore urge the teachers to integrate ICT tools in the teaching and learning of English as the benefits are many. The successful implementation of ICT integration needs the concerted effort of all the stakeholders. The full cooperation and support from the school administration, positive attitude of English option teachers, continuous training to update teachers' ICT skills and appropriate training on when, when not and how to use ICT tools appropriately in classroom situations is necessary to fully realize the benefits of ICT integration.

REFERENCES

- Carmen et al. Use of ICTs and the Perception of E-Learning among University Students: A Differential Perspective according to Gender and Degree Year Group in Interactive Educational Multimedia, No 7 (October 2003) pp 13- 28)
- Dawes, L (2000) 'The National Grid for Learning and the professional development of teachers: outcomes of an opportunity for change', De Montfort University: Unpublished PhD Thesis
- Fraenkel, J.R, Wallen,N.E.(2000), How to Design and Evaluate Research in Education – Fourth Edition: McGraw-Hill Higher Education
- Frayser, D., Creating a New World of Learning Possibilities through Instructional Technology: Part One. AAHE TLTR Information Technology Conference, Colleges of Worcester Consortium, Fitchburg, Massachusetts April, 1997. Available at <http://www.sarg.ryerson.ca/~dmason/common/euit.html>. Last access date 19/2/2005
- Heppell, S (1999) 'Tripping the light fantastic in on-line', Computers in Education, Times Educational Supplement in Leask, M. and Meadows, J. *Teaching and Learning with ICT in the Primary School*, London: Routledge

Laporan Prestasi SPM 2004 , Lembaga Peperiksaan, Kementerian Pendidikan Malaysia

ImpaCT2, 2001 (<http://www.becta.org.uk/impact2>)

Smart School Bulletin, Volume 1 January 2005. Bulletin produced by Educational Technology Division of the Ministry of Education

Smart School Bulletin, Volume 2, August 2005. Bulletin produced by Educational Technology Division of the Ministry of Education

Software and Information Industry Association (SIIA) Report (<http://www.eschoolnews.com>)

Sirotnik, K.A.(1989). *Studying the education of educators: Methodology*. Technical Report No 3. University of Washington, Seattle, Washington: Centre for Educational Renewal.

Addresses of other websites referred to in this study

<http://www.bppt.com.my> - Accessed on 23rd January 2006

<http://www.moe.com.my> – Accessed on 5th January 2006

<http://www.ppk.kpm.my/smartschool> - Accessed on 30th December 2005

<http://www.becta.org.uk> – Accessed on 27th December 2005

Copyright for articles published in this journal is retained by the authors, with first publication rights granted to the journal. By virtue of their appearance in this open access journal, articles are free to use, with proper attribution, in educational and other non-commercial settings.

Original article at: <http://ijedict.dec.uwi.edu/viewarticle.php?id=161&layout=html>