Chapter 1 : Integrating ICT into Learning and teaching

integrating ICT into pedagogies/teaching-learning depends on high levels of interactivity amongst and between students and instructors, and between students and the technologies.

These changes have not just been of a technical nature but more importantly of a structural nature. Many of the major institutions of our society have changed and the way we live our daily lives have been impacted. However, the impact on education may just beginning to be felt as teachers integrate this new technology into their teaching. In the early stages of the use of ICT in teaching, looking at the experiences of teachers at a high school in the forefront provides some clues as to what possibilities and problems may be presented with this new technology. The purpose of this study is to answer the following research questions: Methods A qualitative case study research method was chosen because it would provide thick and rich descriptions of how these changes are being experienced by teachers. In the early stages of the use of a new technology it is useful to use a open ended research method which allows unexpected findings to emerge that might otherwise be missed. The school has 38 teachers and offers grade to students. With the permission of the School Board and Principal, a written request to conduct interviews were made directly to all teachers at the school. Thirteen teachers, from various subject areas, responded to the request and interviews were conducted in person at the school at a time suitable to the participants. The semi-structured interviews lasted from 45 minutes to one hour. All interviews were transcribed verbatim by the researcher, then coded by categories used in the interview protocols and other categories which were added as a result of information raised during the interviews. Findings Changing Teaching Teachers could give many different and specific examples of how technology had changed their work. A number of things were being done with Web sites, from giving students notes which one teacher described as a "low end thing," to getting students to create their own Web pages. One teacher was using a Web site to enhance an actual field trip. The Web site introduces students to the animals and tells them what they are going to be doing while on the field trip. It shows them techniques they can use to analyze the ecosystem and record the data. The prior preparation through the Web site helps students benefit from the actual field trip. Several teachers mentioned that they used Power Point and other computer programs to improve their presentation of material to class. Teachers explained that technology enabled teachers to deliver more material to students and it also eliminated several basic problems such as; poor hand writing, poor artistic skill, contrast, lighting, and visibility. Another teacher makes extensive use of software programs to help teach physics. The students go into the laboratory and collect their data using the computer. Then they use word processing programs along with Excel to do graphs and presentations. The software allows the students to collect different kinds of data using various attachments that are plugged into the computer. Using computer technology, students have more time to explore beyond the mechanics of counting dots and setting up the experiment. It actually lets them look at it and understand the concepts better. Another teacher made the point that resource-based teaching or resource-based learning is almost becoming "seamless, almost natural" in everything that teachers do because information is becoming easier to access. Many teachers mentioned that they had students show them how to use technology. One teacher commented that when students could help teachers, it gave the students a big confidence boost. Some teachers went as far as to use terms like "co-learners" to describe the new relationship between teacher and student. Teachers also saw the potential for technology to be isolating and realized that classroom and other activities had to be arranged in a way that reduce the likelihood of isolation. Another point made, was that in some ways the use of new technology may be increasing socialization in some ways. People may be able to find someone who has interests similar to their own to converse with, through the Internet. One teacher put forth the idea that the use of technology in the classroom will mean the Arts and Music as areas where students interact, will increase in importance to increase socialization. Administration and Expanding Professional Networks The use of information technology has changed school administration in several ways. One teacher explained that when she started teaching six years ago, it was not expected that teachers know how to type their own test. Now teachers are expected to know how to use word processors and have their tests done in a proper format.

Several teachers noted that there is a move toward recording grades and attendance electronically. Teachers are expected to check their e-mail, and a lot of things that used to be done at a staff meeting are now done via e-mail. Also, e-mail is becoming an important communication tool between parents and teachers. In addition most of the teachers use e-mail to keep in touch with other teachers and friends. Concerns Teachers have about the use of Technology While recognizing that there were some concerns and problems with integrating the use of information and communication technology, teachers thought it was beneficial to the educational process and should be continued. Several concerns emerged from the interviews. The problem most often noted by teachers was the maintenance of the equipment needed to operate a technologically enhanced school. Another frequently mentioned problem was the disparities between students who have access to computers at home and those who do not. Teachers provided evidence of the importance of the efforts in-school to promote professional development in integrating information technology into classroom teaching. The professional development days held and the flexible mentor type training available at the school was viewed as being very important by the teachers interviewed. Teachers recognized that sometimes students are overwhelmed with the amount of information available and with the task of filtering through the information. Pace of Change and Stress. Tachers have a hard time keeping up with the pace of change. One teacher said , "People are stressed. Families are stressed", and she felt this level of stress is being transferred to young students. She said, "there is a lot of cutting and pasting going on. Another emerging issue, is the possible loss of control of the education process to business partners. Balancing the interests of these partners and that of the students might be an increasingly challenging role for administrators as business involvement in education becomes more common. Teachers stated that information technology was placing more demands on their time. Teachers noted that extra time was needed to learn new software and also to create new things for teaching because greater expectations were being placed on them. Discussion The use of ICT is changing teaching in several ways. With ICT, teachers are able to create their own material and thus have more control over the material used in the classroom than they have had in the past. Rather than deskilling teachers as some scholars claim, it seems that technology is requiring teachers to be more creative in customizing their own material. Also, using Web pages to enhance an activity demonstrates that technology can be used to complement other aspects of good teaching rather than replace them. It is evident that involving students in the creation of useful material as a part of a learning exercise is a way to make school more meaningful for students. While the use of Power Point presentations have been criticized by some, teachers at this school provide examples of how it helps them with their teaching. The use of peripheral devices on computers to help with physics experiments again shows how ICT can be used to aid the learning process and help students focus on higher level concepts rather than less meaningful tasks. The changes caused by the introduction of information technology into learning environments, are not without some potential problems which must be considered by administrators. The information from this school indicates that some fundamental rethinking of the education process may be necessary because of the use of ICT. This will also put pressure on the school system to restructure the way education is organized. Further Reading A more extensive report of this research has been published: The integration of information and communication technology into classroom teaching, Alberta Journal of Educational Research. Scott Reid is a Ph. Candidate at the University of Ottawa and his research interests include the integration of technology into teaching and human reaction to change. He can be contacted at: For more information about these research reports and other activities of the Trent Valley Centre contact:

Chapter 2 : What is ICT Integration | IGI Global

Integration of Information and Communication Technologies (ICT) into teaching and learning process is a growing field which has variety of definitions according to different points of view.

Some of these changes are due to changes in government policies related to the use of information technology IT in schools while others are due to developments in state of the art pedagogical practices. Others are due to the continual advancements in technological products and systems themselves, both the hardware and the software. Most countries including Malaysia have been working hard for the last few years to develop policies and strategies for school to infuse technology into schools. The reasons for these efforts are not difficult to understand: The need for knowledge workers and become a developed nation place tremendous responsibilities onto schools and educators to prepare their children to meet global technological changes. In preparing students for their role in society, the Malaysian Ministry of Education has identified technology along with literacy and communication, problem solving and human relations as a foundation skill area to be developed in every subject. The uses of information, communication and technology ICT will not only enable the students to learn but to also enhance their understanding of the connections between technology, society and the environment. Hence this paper will discuss the methods and the importance of integrating ICT in teaching and learning and the concept of Smart School project. The role of the computer as a tool and a tutor will be highlighted. The relationship between learning theories and the use of ICT will be discussed. Furthermore this paper points out the role of the leader in developing IT culture through policy making and plan development, supervision of resources, staff development and community support in integrating technology into teaching and learning. Strategies of ICT integration in acquiring skills and knowledge among the school community will be suggested. Introduction During the past decade there has been an exponential growth in the use of information communication and technology ICT , which has made pervasive impacts both on society and our daily lives. It has transformed the way people live and work, communicate, entertain and conduct businesses. In becoming a developed nation in sixteen years to come and heeding the call of gaining competitive advantage, Malaysia has embarked on a massive project namely Multimedia Super Corridor MSC. The project aims at revolutionizing information technology and multimedia 1 industries by creating a massive corridor with suitable environment for local and international companies wanting to create, distribute and employ information technology and multimedia products and services. MSC Multimedia Super Corridor is also expected to place Malaysia as a regional and international technology and become the test bed for research and development in high technology industries. Due to the increasing demand for knowledge workers in the information technology and high technology industries of the MSC, a Smart School program was adopted as one of the seven flagship applications Nurhizan Abdul Manab and Azman Othman, The objective of the Smart School application is to transform the school culture to one that is informed, thinking and caring information and multimedia technologies will be widely used to improve the effectiveness of the teaching learning and management process. Greater emphasis has been placed on integrating technology into the Science, Mathematics and English curricular. The project not only emphasizes the need to develop an efficient and technologically literate thinking workforce but also will strive towards enabling students to perform in a global environment. Therefore new elements will be infused into the school system. The focuses of the Smart School initiative are as follows: Emphasis on maturity of thought, application of information technology and the assimilation of noble values. Proficiency in Science, Mathematics and English. Enhancement of performance according to individual capabilities. Contributions to the development of knowledge. The implementation of the Smart School flagship calls for new roles and responsibilities on the part of students, teachers and the community. In a Smart School, learning is self-directed and caters to students with varying capabilities. The Smart School project has been implemented in phases. In the initial phase, which was from to we have established 89 smart schools with the total enrolment of 85, students Malaysia Ministry of Education,

There were three pilot projects being implemented under the Smart School initiative namely: Teaching-Learning Materials Comprehensive teaching-learning material has been prepared for four selected

subjects in all grades namely National Language, English, Science and Mathematics. The aim of using interactive material is to enhance teaching-learning strategies. Management System The Smart School Management System will enable school administrators to efficiently and effectively manage the resources and processes required to support teaching and learning functions. This involves reallocating skilled human resources to more useful activities, saving cost over the long term, upgrading the quality of delivery through better access as well as accelerated and enhancing decision making. Teachers, students and parents will have on-line access to details about assessment items. There will be greater flexibility in the administration of assessment. Apart from establishing the Smart School project the government has reviewed the education policy in responding to the environmental changes Rohani Hamid, Emphasis has been given to critical subjects, which are English, Mathematics and Science. Malaysia has primary schools and secondary schools. The planning of providing computers to all the schools in the country were done in stages: All schools 3 The government has budgeted USD 1. The Ministry of Education is serious in its endeavor to equip schools with computers and appropriate telecommunication for database and Internet facility. However the most pivotal element in integrating technology is the understanding of the teacher in the content of the teaching process related to technology. The integration of ICT into teaching and learning needs competencies and commitment of the teachers consistently. Teachers who integrate technology must add value to their activities such that if one were to remove technology, the quality of the lessons would somehow be diminished Williams, What is technology integration? According to Pisapia , integrating technology with teaching means the use of learning technologies to introduce, reinforce, supplement and extend skills. The difference between the classroom of exemplary users of technology and technology users is in the way their classes are conducted. In the exemplary classrooms, student use of computers is woven integrally into the patterns of teaching; software is a natural extension of student tools. Roblyer puts it in another way. He states that the most important and the most difficult challenge is how teachers can help to improve existing conditions or to create important educational opportunities that did not exist without information technology. As part of this process, teachers decide what they need to make these changes occur. This process of determining where and how technology fits is known among users of educational technology as integration. From the perspectives of educators, the function of ICT in schools is not primarily to promote computer literacy or because technology is the fad of the 21st century or just for the sake of using computers in the classrooms. Rather the function of technology in schools is to enhance teaching and learning. Using technology in any other way is not true integration. There are many integration strategies but the important thing is that 4 each strategy addresses a specific learning or teaching need. In general most effective approach is one of solving instructional problems. That is technology should be viewed as one means of solving some of the problems which teachers face in their teaching and which learners face in their learning Williams et al. Why the integration of ICT? Potential strengths and weaknesses of ICT in teaching and learning have been well documented in the literature with the former probably outweighing the latter. Warschauer asserts that ICT can enhance student motivation by helping students gain knowledge and skills about using computers, giving ample opportunity to use electronic communication, and carefully integrating computer activities into the regular structure of the lesson for meaningful learning. According to Abdul Rahim Saad , there are two types of students learning style namely field dependent and field independent. Learning activities can easily take place as the field independent student grasp the concept through an abstract method as compared to their field dependent counterparts who need various types of teaching methods. Hence the teacher must fully utilize and exploit the use of ICT in helping students learn more effectively. The use of Internet in teaching and learning provides opportunity for teachers and students in exploring and searching for information and references. They could easily access an almost limitless variety of resources and share information with their peers any time, anywhere since electronic communication compose no boundries of time or geographical location Zalina Yahaya, Furthermore on-line interactive multimedia educational websites may assist learners in a mixed ability classroom. A number of the websites may help learners in a mixed skills and activities for accelerated students and remedial or tutorial material for slower learners Godwin Jones, The information technology and Internet can also promote collaborative teaching and learning and raise the achievement of the students. These results

suggest that the Smart Schools were more effective in 5 promoting the Malay and English language achievement of Form Two students than were Traditional schools which emphasize on chalk and talk method. Hull states that integration of ICT in teaching and learning allows teachers to create contextual learning experiences for the students. Contextual learning emphasizes the way that knowledge is embedded and applied in real-world activities, including the world of work. Ramlee and Abu Abdullah , note that a contextual learning approach gives meaning and depth to learning in technical and vocational education in Malaysia. However contextual teaching has been difficult to carry out within traditional school structure. Many schools lack resources to participate in contextual learning. Concerned about liability, transportation and propriety knowledge often keeps students from the workplace. Therefore multimedia technologies and the Internet can provide schools with potential access to the world outside of the school. For instance using a world wide web www to connect teachers and learners to the work place. A learner can use multimedia technology to stimulate a problem-solving environment. Hence the skill and knowledge in technology will produce multi-skilling students with confidence and readiness in facing the competitive world. The task to formulate the strategies in integrating and establishing the use of ICT in teaching and learning are not only on the shoulder of the teacher but also the school principal. The role of the principal in molding the culture of technology in school is imperative. Managing the use of school technology poses a host of difficult issues and challenges for principals. However the principal needs to set a proper strategy. To implement technology successfully, all people must be encouraged to participate in the implementation process. Early and extensive participation in a change should be part of implementation. Participation gives those involved a sense of control over the change activity. The teacher understands it better and they become committed to successful implementation. In order to permeate the 6 culture of ICT, teachers should be involved from different grades, staff from all the functional areas, students, parents and community members in the project as a team. In aligning the vision and mission of the school with the policy of Ministry of Education the principal should provide a school based documented procedure. The procedure will assist teachers and students to acquire the skill and knowledge in ICT consistently. In this capacity the principal is responsible for managing the resources necessary for technology integration. Being concerned about the knowledge and skills of the principal in ICT, a research on the level of acceptance on the Smart School program by the respective principal was conducted by the Faculty of Education, National University of Malaysia. The results showed that only The findings therefore triggered the Ministry of Education to design the module of training in stages starting from the very basics of using the computer to managing the ICT by using the Smart School Management System. Many teachers have lacked meaningful opportunities to acquire the skills needed to meet the ICT outcomes.

Chapter 3 : Integration of ICT into Classroom Teaching

Integrating ICT into Learning and teaching THIS IS A PLACE WHERE TEACHERS HAVE BEEN LEARNING ABOUT TOOLS AND WAYS TO INTEGRATE ICT INTO THEIR CLASSES. FROM NOW ON, I'M GOING TO USE IT AS A PORTFOLIO FOR THE WORKSHOP ON NEUROSCIENCE IN EDUCATION

Integration of Information and Communication Technologies ICT into teaching and learning process is a growing field which has variety of definitions according to different points of view. The primary point that draws attention in the process of the integration of Information and Communication Technologies ICT should be the broadness of concept of integration itself and the variety of definitions related to ICT integration. This variety should encompass a broad framework from a point of view that regards it sufficient to use ICT in lessons, to; the point of view according to which this process should be routine, permanent and should contribute to the learning process of the student. However, the definition of ICT integration in a broad framework should encompass the permanent use of ICT in the classroom to improve student learning. The answers given to this question may vary according to two points of view on the integration process. The first is the technological point of view, which supports the integration of technological infrastructures and systems into the educational environment; the second is the pedagogical point of view, which supports the integration of ICT materials and programs in terms of social constructivist learning principles Richards, The convergence of pedagogical and technological points of view supports effective connections between suitable technology for content and pedagogical principles to design learning environments. Accordingly, teachers need to know why and how to use ICT applications and resources given the characteristics of learners. This sample plan includes the problem that necessitates the use of ICT in the lesson, the ICT applications and resources, ICT application skills, application strategies as well as reflections and suggestions related to the th use of the application. Table 1, shows a sample lesson plan of a 6 grade mathematics course. Probability and Subfield of Learning: Tables and Graphics Statistics 2. Measures of Central Tendency and Spread Problem: The elections of school representatives are approaching. There will be a representative of each class. There is more than one candidate in class 6-A. The class is divided into groups and the groups prepare a working plan in order to determine the working program of the prospective representative. The tasks in the working plan are to prepare and conduct a questionnaire amongst the candidates, to draw a table using the data in hand, to present the data in appropriate statistical forms, to make estimates in accordance with the obtained data, to prepare the reports of the plan and to present it to the class. Observing and interpreting the data in appropriate statistical forms. Explaining in what conditions column charts cause misinterpretation. Calculating and interpreting the arithmetic average of data and data gaps. Making estimates in accordance with the obtained data. ICT Resources and Materials: Word-processing programs to prepare lists. Internet to draw tables and graphics by researching. Presentation programs to present studies. E-mail and communication programs to communicate. Ability to use application software, ability to use on-line communication tools. Students shall be divided into groups in order to carry out the studies described below. The stages of this study shall be offered to students with the related documents. They shall prepare the questionnaire and shall evaluate it in accordance with the five â€" point Likert scale. They shall conduct the questionnaire of their chosen sample size from within the population universe 3- Students shall transfer the results of the questionnaire to given web site and shall decide with which statistical table they shall show it. They shall present that data using the most appropriate methods column chart, pie chart. In addition, they shall calculate the arithmetic average and the data gap of each data obtained in the questionnaire. Then the groups shall discuss how they interpret the data. The project reports and presentations shall be evaluated based on rubrics. The Purpose of The Study: Hence, this model is not a linear model, but a cyclical model. All the structures formed under the guidance of the questions in the model were taken into account, both individually and as a whole. Why should ICT resources and applications be used? For whom shall ICT resources and applications be used? The subject of the integration of ICT into teaching-learning process is students or, in other words, they are the learners who are subjected to the integration. For this reason, it is important to determine the characteristics of learners who are the target group

of the integration process. Therefore, it is necessary to designate for whom ICT resources and applications shall be used and to identify the characteristics of these users. In addition to cognitive, affective, social and physiological characteristics of learners, ICT literacy should be taken into consideration. How will ICT resources and applications be used? The sample lesson plan given above Table 1 is assumed to be beneficial for answering this question. Which ICT resources and applications should be used? Where will ICT resources and applications be used? The place where ICT resources and applications are used in the teaching-learning process may be the classroom or laboratory as well as any place out of school such as home, library, scientific centers, museums or on-line environments. It is more important to prepare the appropriate environment for the integration of ICT into teaching-learning process. The physical conditions of the environment is important, in addition to its user-friendliness and the availability of technical support. The environment where ICT is used should be a pedagogically, b technically, c physically and d managerially appropriate. When should ICT resources and applications be used? Conclusions and Suggestions The purpose of this study is to develop an unified model for the integration of ICT resources and applications into teaching-learning processes. With the help of this study, the integration process will gain clarity and thus students will strengthen their learning. In addition, an integration scale is planned to be developed as the continuation of this study. All the structures formed under the guidance of the questions in the model are taken into account both individually and as a whole. Therefore, it is also important for the continuity of the process; the observation and evaluation processes to deal with the contexts formed in this manner. The integration and embedding of ICT into the school curriculum: Integrating Information Technology into Education. Technology and its impact in the classroom. The Integration of Information and Commnication Technologies in learning and teaching process: A lesson plan example. Education and Science, 32 , Tracing the development of teacher knowledge in a design seminar: Integrating content, pedagogy and technology. Toward technology integration in mathematics education: A technology integration course planning assignment. Contemporary Issues in Technology and Teacher Education, 7 4 , An activity-theoritical approach to research of ICT integration in Singapore schools: Orienting activities and learner autonomy. Computers and Education, 43, Exploring critical aspects of information technologies integration in Singapore schools. Australian Journal of Educational Technology, 19 1 , Teaching and Technology in higher education: Technological pedagogical content knowledge: A new framework for teacher knowledge. Teachers College Record, 6 , Preparing teachers to teach science and mathematics with technology: Developing a technology pedagogical content knowledge. Teaching and Teacher Education, 21, â€" Towards an integrated framework for designing effective ICT-supported learning environments: The challenge to better link technology and pedagogy. Technology, Pedagogy, and Education. Integrating Educational Technology into Teaching 3rd ed. Creating student- centered classrooms. ICT in the learning-teaching process: Journal of Education, 32,

Chapter 4 : Integrating Technology into Teaching and Learning. | Rusmini Ku Ahmad - calendrierdelascien

Globally, educational systems are adopting new technologies to integrate ICT in the teaching and learning process, to prepare students with the knowledge and skills they need in their subject matter. In this way the teaching profession is evolving from teacher-centered to student-centered learning environments.