Chapter 2

REVIEW OF LITERATURE

Introduction

The growth and expansion of new technologies and global information is changing the image of our school system and our classroom teaching and learning. To be ready to teach in a technology-supported environment of the Smart School, teachers need to know its characteristics; be informed of technological knowledge and skills required of them and acquire (if they do not have) new knowledge and skills that are essential to integrate technology into classroom activities.

Teachers also need to know the benefits of integrating Information Technology that enhances the teaching and learning process. Smart School is a new phenomenon in Malaysia. Research on teachers' readiness to teach in Smart School in this research paper will be restricted to a study of a technologically-supported school.

Changes in the School System

Schools have historically been slow to change as compared to telecommunications and business. However, one thing is certain about the future of schools and technology: change. Societal demands and the changing needs and requirements of teachers and students have and will continue to emphasize the importance of applying technology in instructional practices.
a. Characteristics of Existing Schools

In most schools today, education occurs in school buildings where the curriculum is focused upon essential information. Subsequently teaching takes place in the classroom where the teacher is the primary source of information and asks most of the questions. Students learn by acquiring information from teachers, books, and other educational materials.

Most often students perform the same task and take tests to show their achievements in schools. In these schools, teachers are disseminators of information. They deliver facts, rules, theories and principles to students. Information is pre-packaged, lectured or delivered from textbooks. The use of technology, such as computers is merely that of a teaching tool. Information is selected and organized sequentially by the teacher and the whole learning process is determined and controlled by the teacher.

Our school practices and instruction as such will obviously be outdated in the Information Age. Studies by William & Moss (1993) confirmed that our current nature of education is based on outdated practices, more suited to the industrial age.

They related the daily scenario where about forty students gather in a classroom to listen to a teacher for forty minutes. Then all students work on the same assignment with the teacher giving each student about sixty seconds of guided feedback. This procedure is repeated five to six times daily for varying subjects.
During this time the teachers assume that all students would immediately understand and complete the assignment diligently.

It is obvious here that students are passive learners in a class where there is little or no interaction either among themselves or with the teacher. Lessons are not adjusted to cater for individual differences of the students. Most often learning in our textbook-based classrooms is irrelevant and does not prepare students for job requirements.

b. Characteristics of Smart School

In a smart learning environment, education can take place anywhere; in class, in computer and multimedia laboratories, at home via the internet, CD-ROM and other Multimedia terminals. Here the curriculum focuses on teaching analytical, problem solving and thinking skills. Contrary to existing schools, students can experience individualized, co-operative or collaborative learning in pairs or in small groups using computers and other new technologies. Decision to be assessed is the choice of the student whenever he/she is ready as registration is on-line.

Today, we are constantly faced with an increasing amount of information. Teachers therefore must be ready to shift from teaching in traditional schools to teaching in Smart School to cope with increasing information. Teachers need to be prepared to teach where technology plays a vital role in enhancing teaching
and learning. Students need to be assisted to keep up with new information. Thus, teachers must play the role of facilitators and "guides by the side" rather than their traditional role as "sage on stage".

In our new school system, teachers need not take full responsibility for their students' learning nor need to know all information in order to deliver it. Teachers however must be information literate. They need to have technological knowledge and skills to access, evaluate, analyze and synthesize information before guiding students in their learning.

**Need for Information Literate Teachers**

The success of Smart Schools among other factors is the presence of professional teachers. Teachers are expected to be learning enablers, mentors, tutors and facilitators encouraging and developing interactive and collaborative learning activities. In this context, Smart School teachers are required to be information literate.

For instance, Hubbard (1996) defined an information literate as one who recognizes accurate and complete information, uses it for decision making, identifies and accesses information, evaluates, organizes and uses it for critical thinking and problem solving.

Professional development of teachers is crucial in executing new innovations. In this respect, teachers need to be intensively trained in the use and integration of
Information Technology into classroom activities to enhance thinking and creative skills. Since living in an information-based society means having to deal with massive amounts of information, teachers' success and survival depend on their abilities to locate, analyze, and use information skillfully and appropriately. Teaching their students information skills is equally essential. This valuable skill is necessary for students to cope well with information.

According to Moore (1996), information skills prepare students to meet the demands of the information age. Problem solving, decision making, critical thinking, information gathering, and sense making are abilities required of students. These skills must be taught in schools, in addition to the basic computer skills, if students are to function in an information environment. Thus, how many of our teachers are, or need to be trained in information technology is an important question that has to be answered before further considerations are made for Smart Schools.

**Need for Teachers with Technological Experiences**

Kwok (1993) stressed that nearly all innovations require changes in teacher's roles regarding the use of new materials, alterations in their teaching behaviors and changes in their beliefs and attitudes. However not many teachers, pre-service or in-service can confidently use and integrate Information Technology into their classroom instruction without undergoing intensive training. To use Information Technology, teachers need to have
technological knowledge and skills to successfully use, to name a few
technological applications, such as the word processor, the e-mail, CD ROM
Databases, Internet, and Multimedia.

These technologies can assist teachers in managing and improving their quality of
instruction. By using the e-mail teachers can easily communicate with their peers
or consult experts. Electronic communications expand teacher's relationships with
parents and students. From the Internet teachers can access vast information on
new teaching-learning strategies, journals, periodicals, electronic magazines,
global news and other educational resources related to their area of interest.

Need to Integrate Technology

Integrating Information Technology, especially computers and multimedia into an
existing traditional teacher-centered classroom is not only a challenge but also an
opportunity for Smart School teachers. To adopt
Information Technology, teachers must have positive attitudes towards it and be
confident in using it.

Studies on technology using teachers by Tucker(1984) found that teachers
working in technological environments shifted their educational approach from
that of a knowledge transferor to a knowledge builder. They also reported that
these teachers experienced increased productivity, a sense of efficacy and
personal success using technology.
Since smart classroom activities are inclined to be student-centered, the Smart School Conceptual Blueprint (1997, p. 43) proposed various learning strategies for classroom use. These strategies are mainly computerized and technology-based, they include the following:

a. **Directive Strategies** - comprising drills, practice, mastery learning, and direct instruction

b. **Observation Strategies** - that is learning by observing others perform the task

c. **Meditative Strategies** - comprising direct coaching and guidance

d. **Generative Strategies** - assisting students to use their individual abilities appropriately, also includes brainstorming, lateral and creative thinking approaches

e. **Collaborative Strategies** - help students use interpersonal skills to accomplish tasks

f. **Outside-Context Learning Strategies** - these are activity-based, hands-on sessions, seminar, workshops and do it yourself programs

g. **Metacognitive** - students learn by thinking about the learning process, evaluate their own performance and work towards improving themselves

New technologies can be used as tools to facilitate the above learning strategies, for example, by integrating collaborative learning strategies with the aid of computers, interactive videos, and hypermedia, teachers can create collaborative classroom environment whereby students can be active participants in the learning process. In a study by Tweddie (1993) it was found that cooperative and
collaborative learning resulted in higher achievement and more positive attitudes compared to competitive or individualistic learning.

Another related study by Fields (1993) supported the integration of Information Technology with collaborative learning strategies. They concluded that integration prepares students to overcome obstacles, since more information is taught in a shorter time.

Conclusion

Successful application of Information Technologies into the smart classroom will depend on the knowledge and competence of teachers using existing and new teaching approaches and adapting them to future needs and instructional developments.

Although the success of implementing Smart School will be greatly influenced by teacher readiness to integrate technology in their teaching, other factors such as adequate funding, administrative and technical support and appropriate training are not less important. It is felt that more studies would be carried out to contribute to a more complete and comprehensive report on this issue.