The Impact of Educational Change in Malaysian Smart Schools on Islamic Education Teachers and Students

By

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List of Abbreviations

EPU	Economic Planning Unit
ICT	Information and Communication Technology
IRPA	Intensification of Research in Priority Areas
IT	Information Technology
KBSM	Secondary Schools Integrated Curriculum
KBSR	New Primary School Curriculum
MDeC	Multimedia Development Corporation
MMoE	Malaysian Ministry of Education
MSC	Multimedia Super Corridor
NCLB	No Child Left Behind
NEP	Malaysian National Philosophy of Education
PMR	Lower Secondary Examination
RM	Ringgit Malaysia
SI	System Integration
SPM	Malaysian Certificate of Education
SS	Support Service
SSMS	Smart Schools Management Systems
TI	Technology Infrastructure
TLM	Teaching and Learning Materials
UKM	National University of Malaysia

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Declaration

I certify that this is my own work and it has not been submitted for a degree at another university.

Abstract

This study is an attempt to investigate the impact of educational change in Malaysian Smart Schools on Islamic Education teachers and students. This study is trying to understand all aspects of the change process in Smart Schools and to understand the problems of students and teachers as they endeavour to improve learning and teaching in Smart Schools. Following the implementation of the Smart School pilot projects in the Malaysian secondary schools, this study is aimed at suggesting an approach that can be used to incorporate the use of computers and ICT in Islamic Education by taking into consideration the views, experiences, expectations and needs of the teachers and the students themselves.

In examining the new initiative of Smart Schools, a mixed methods design was adopted to gather the data needed from Islamic Education teachers and students. A grounded theory approach was used in the early phase of the study as this approach is suitable for this relatively new field where little research has been done. This research began with an exploratory phase which involved the use of focus groups as a means to gain knowledge of respondents' views, perceptions and attitudes about Smart Schools. The results from the focus group were used as initial data to develop a structured questionnaire for a large survey study in the Smart Schools. The last phase of research involved an in-depth interviewing process to clarify and validate the previous two phases of research.

This study found that the use of computers was the core feature of the change phenomenon in Smart Schools. Islamic Education teachers and students were hardly coping with the task of incorporating the use of new technology in their teaching and learning. Many barriers and obstacles in using new technology were reported by Islamic Education teachers and students. The most important barriers identified in this study are the lack of computers and available resources, lack of training, shortage of time and the pressure of a heavy syllabus and examination-centred learning. This study also notes the influence of subject culture in determining the use of computer in Islamic Education. This study also suggests some recommendations for the future implementation of Smart Schools throughout Malaysia by year 2010.

Chapter 1 Introduction to the Study

The subject of this study is an investigation of the impact of educational change in Malaysian Smart Schools on Islamic Education teachers and students. In particular the focus is on the views and attitudes of Islamic Education teachers and students regarding technological and educational change in their schools and classrooms. This study also investigates the main barriers in implementing technology and ICT in Islamic Education teaching and learning. This study draws from my experiences in teaching Islamic Education in schools and my interests in a professional career as a lecturer in the Faculty of Education at the National University of Malaysia.

My interest with ICT use in teaching and learning started when I was involved in a series of research studies in the National University of Malaysia. The series started in 1999 with research funded by the Faculty of Education National at the University of Education entitled "Development and Evaluation of SMART Net as an Internet-based Teaching and Learning Tool" to develop an integrated web-based learning for English, Malay and Arabic (Embi 2000).

This project was later continued for a further two years from 2000-2002 with increased funding from IRPA (Intensification of Research in Priority Areas) under the Ministry of Science, Technology and Innovation. The aim of this project was to develop a self-access online learning-to-learn model for Malaysian secondary schools (Embi 2004). From this project, I realized both the potential of ICT to enhance teaching and learning in schools and the enthusiasm of students for learning through computers and the Internet.

My keen interest in ICT use in education lay parallel with that of our Government in ICT and the announcement of the Smart Schools' initiative. The pilot project of Smart Schools operated in 90 schools in 1999. This type of school was the first in Malaysia to take advantage of the leading technology in ICT. The aim was to revamp the traditional teaching and learning process in the classroom and to have 10,000 Smart Schools in operation throughout Malaysia by the year of 2010.

In the beginning of the Smart Schools' initiative in Malaysia, I was particularly interested with the future teaching of Islamic Education which is my own subject at the university. Unfortunately, Islamic Education was not chosen as one of the four Smart subjects in the pilot project. However, it will be next in the list in the roll-out phase of Smart Schools. This made me wonder what the future will hold for Islamic Education in Smart Schools even though I am fully aware that Islamic Education is one of the core subjects in our national curriculum.

It made me think about how Islamic Education teachers, who are well known for their loyalty to traditional methods of teaching, and how their students, who are keen to take advantage of this new technology to learn about their religion, would react to such change. These, then, were the main catalysts which drove me to take up this research and I am hopeful that the findings of this study will be beneficial for me and my people in Malaysia.

1.1 Problem Statement

From the very beginning, the implementation of Smart Schools has been associated with problems. The most obvious problem was regarding the courseware provided for Smart Schools. The software currently used in schools in the Smart School project has been criticised by parents and teachers as sub-standard and not suitable for high-achieving students. Education Minister, Razak (1999) has admitted that the ministry's courseware is "not up to the mark." But he explained that it was for temporary use only and would be replaced in the software's second version.

Deputy Education Minister, Onn (1999), has also acknowledged this problem and vowed it would soon be solved. He promised that the new software will be better than the first batch since the new version will take account of the feedback from Smart School teachers who have been using the existing courseware.

The problem of the Smart Schools' software arises because the Ministry had failed to determine the needs of their clients from the very beginning of the software's development. The Ministry has confessed that it made a mistake in not taking the views of teachers into account and has given an assurance that the feedback sought from teachers should solve the problem. However, the Ministry also forgot to seek the views of students who were the end-users of the software in the first place.

Initially, the project for designing and developing the software was awarded to the Telekom Smart School Sdn Bhd Consortium which sub-contracted it to several companies. According to Baba (2000), Director of Educational Technology Division Ministry of Education Malaysia, external consultants were appointed to develop the software. This included scripting, designing, graphic interfacing, animation, sound, video clips and storyboard simulation. Ministry personnel were only seconded to the company to review and evaluate the final product.

The monitoring process of sending Ministry personnel seconded to evaluate the software was a sensible move. But, again, the main question arises regarding the role of teachers and students in the development process. Significantly it has been neglected despite the fact that much research has stressed the importance of taking on board students' and teachers' views in any educational development and change intended to meet their needs (Fullan 2001).

The use of software in Smart Schools is also falling behind schedule. Education Director-General, Abdullah (2000), said there would be a slight delay because it has taken time to develop the software and by the time this problem had been solved, Smart Schools would be using interim software developed by the Ministry. Education Deputy Director-General of Technical and Vocational, Ministry of Education, Ibrahim (2000), said it was taking time to write the software for English, Mathematics, Science and Malay language. He also stated that it would take about four years before the programme would be fully developed and in use.

The pilot project of Smart Schools was implemented for a period of three years from July 1999 to July 2002. After the pilot project, it was envisaged that the Smart Schools curriculum could be implemented in all schools encompassing all subjects taught in schools. Perhaps the main concern for this research is the impact of the implementation of the Smart Schools' initiative on Islamic Education teachers and students. If the current software for Smart Schools has taken longer to develop because of the failure to collaborate with the teachers and students as end users, then a study must been done in advance to help to identify the needs of Islamic Education teachers and their students before the next roll-out phase of Smart Schools is implemented.

It is also very important to remember that every subject, including Islamic Education, has its own methodology and pedagogical approach. The nature of teaching Islamic Education is different from the current chosen Smart subjects like Malay, English, Mathematics and Science. Therefore, it is crucial to carry out research to discover the views of Islamic Education teachers and students regarding the teaching and learning of Islamic Education in Smart Schools.

1.2 Rationale of the Study

The use of ICT in schools is the current focus and concern of the Malaysian Government. This concern has been translated into long-term strategies and substantial funding initiatives. In the Smart School pilot project alone, RM300 millions has been allocated to develop the Smart Schools Integrated System (SSIS) (MSC 2005). The Smart School initiative has been identified as one of the flagships in the Malaysia Super Corridor planning to provide skilled knowledge workers in ICT industries and companies. The Malaysian government is very committed to the use of ICT industries to boost our economy and to become a developed nation by 2020.

Given the importance of ICT strategies for the Malaysian Government and the substantial amount of money allocated for the development of ICT in Malaysian schools, it is extremely important to carry out a study on the impact of ICT use in Smart Schools and to evaluate the current use of ICT in teaching and learning. In this study the focus will be centred on reviewing and re-examining the impact of ICT use in the teaching and learning of Islamic Education.

The use of ICT in Islamic Education teaching and learning is a new practice in Malaysia. Hitherto, Islamic Education teachers have used traditional methods to teach the subject and so it is important that empirical research be done to investigate the implications of using ICT. This study specifically investigates the issues of technology and ICT use in Smart Schools among Islamic Education teachers and students.

As mentioned earlier, the Ministry of Education failed to take into account the views of teachers and students in developing Smart Schools' software. In general, there was a lack of teacher and student participation in the planning of the initiative. Therefore, this study will attempt to understand the views of teachers and students in these schools regarding the changes imposed on them and will attempt to investigate their attitudes towards the changes and the barriers in implementing them.

Hammond (1990:340) said that not many research studies really try to open "the black box" in evaluating policy change in schools. The normal input-output research practice is only designed to determine whether the schools fully comply with the standards and regulations, or to make assessments simply by comparing test scores and academic achievements, without fully examining the participants' views and experiences. This study tries to fill-up this gap by studying the views of participants, in this case Islamic Education teachers and students, in the process of implementing and incorporating the new initiative in their own schools.

1.3 Research Questions

Based on the problems regarding the Smart School initiative and the rationale for the study mentioned earlier, this study tries to investigate and answer the main questions posed below:

1- What are the views and attitudes of Islamic Education teachers and students in Smart Schools regarding the use of computers and ICT in their school? Are there any differences between these attitudes and the backgrounds of Islamic Education teachers and students?

2- What kind of barriers do Islamic Education teachers and students encounter in the use of computers and ICT in Smart Schools?

3- What are the needs of Islamic Education teachers and students in Smart Schools regarding the use of computers and ICT in their school?

4- What lessons can be learnt from the views of Islamic Education teachers and students about the use of computers and ICT in this pilot project of Smart Schools which can be used to enhance the use of computers and ICT in Islamic Education and can be used as guidelines for Islamic Education teaching and learning in the next roll-out phase of Smart Schools?

1.4 Significance of Study

Generally, there has been a lack of empirical study on the use of computers among Islamic Education teachers and students. In particular, no research has been undertaken to investigate the impact of technology and ICT use in the Smart School initiative on Islamic Education teachers and students. The findings of this study may not only help to deepen understanding of the impact of technology and ICT use on Islamic Education. It may also serve as a foundation for other researchers to explore the impact of the Smart Schools' initiative on other non-Smart subjects.

This study will also provide evidences for future development in policy-making concerning educational change in Malaysia. The Ministry of Education was entrusted to carry out long-term planning to provide knowledge workers for our country and help the country attain recognition as a developed nation in 2020 (EPU 2002; Mustapha 2004). Furthermore, Smart Schools are one of seven flagship applications which carry pivotal positions to transform the country from an industrial to an information-based economy. This study, therefore, is very important for understanding the barriers that prevent Smart Schools from achieving their objectives while at the same time enabling evaluation of the strengths and weaknesses of the Smart Schools' initiative as a whole.

This study will also add and contribute to the knowledge of educational change theory in general (Hammond 1990; Fullan 2000a; Fullan 2001; Ravn 2002; Hargreaves 2005); of technology change and innovations in schools (Cuban 2000; Cuban 2001; Selwyn 2001; Robertson 2002; Reynolds 2003). Many scholars, (Siskin 1991; Selwyn 1999; La Velle 2003; Hennessy 2005; Deaney 2006) have suggested investigation of the impact of technology and ICT on subject matters and in teaching and learning generally (PCAST 1997; Zhao 2002)

Chapter 2 Education in Malaysia

2.1 The History of School Changes in Malaysia

Malaysia is a unique country which comprises a multi-ethnic society with a density of population estimated at 26.13 million in 2005 (PMO 2007). From this figure, the whole population is divided into its main racial groups of Malays 54%, Chinese 25%, Indians 7%, and a very diverse group of indigenous people in Peninsular Malaysia, Sabah and Sarawak 11% and non-Malaysian citizens 7% (PMO 2007). Islam is the religion of more than half Malaysians, including all of the ethnic Malays who are defined as Muslims in the constitution.

According to the Malaysian constitution, Islam is recognized as the national religion in the Malaysian Federation, thus enjoying significant privilege and protection under the constitution (Ahmad 2005). However, other ethnics are free to practise their beliefs such as the Chinese, who largely follow Buddhism, and the Indians, who are mostly Hindus. Christians form a small minority, and in some states like Sabah and Sarawak many of the indigenous people follow traditional beliefs. Malay Muslims together with the indigenous people are called Bumiputera (means "sons of soil" in Malay) and under the Malaysian constitution enjoy special treatment in the educational system such as in the quotas for university admissions (Pong 1993).

In the early years after the establishment of the Malaysian Federation, the development of the Malaysian education systems was very much influenced by the diversity of society's structure and the historical events which related to ethnic problems particularly those subsequent to the ethnic riots in May 1969. The need to address the issue of diverse ethnic cultures shaped the educational policy formulation at that time and was considered very important for the future of the nation. A single national school system was established after independence from the British in 1957 with the clear objective of promoting national unity among the different ethnic groups, using a common curriculum and using a standard national language, the Malay Language (Lee 1999).

Before independence, the establishment of Malaysian schools was based on ethnicity and race. The "divide and rule" policy exercised by the British administration had influenced the formation of vernacular schools such as Malay schools, Chinese schools and Tamil schools (MMoE 2006:17). Each and every one of the schools had used their own language, employed their own teachers and chosen their own curricula which were imported from other countries, particularly from China and India. Therefore, the schools at that time were disintegrated and worked on their own with no common curriculum and common vision.

After the era of British colonialism, there was a need to revise the colonial education system and to establish one single type of national school for people of all ethnicities. To this end, a new educational policy emerged from a special committee led by Tun Abdul Razak (first Minister of Education and the second

Prime Minister of Malaysia). This committee made comprehensive recommendations, later to be known as Razak's Report 1956.

The content of the Razak Report became the basis of the education system as protected in the Education Ordinance 1957. The main objective was to establish a single national education system that would promote the cultural, social, economic and political development accepted by the nation as a whole. The Malaysian Government also started to make several evolutionary changes especially to the educational curriculum to correspond with the aspiration for diversity discernible among the Malaysian peoples.

In 1960, the Rahman Talib Report reviewed education policy and became the basis for the Education Act 1961. To speed up the process of national integration and unity, the act ruled that the national language was to be a compulsory subject in primary and secondary schools and in all training institutions. Obtaining a satisfactory grade in the national language became a requirement for the award of a certificate in public education examinations. This meant that all schools which had been English as the medium of instruction gradually switched to the national language.

In the 1960s and 1970s, efforts had been given to replacing and reforming the Western influenced curriculum that had formerly been applied in all national schools. The 1960 Rahman Talib Report stressed the need to form a Malaysian-style curriculum in order to reduce the influence of the Western curriculum (MMoE 2006). Lee (1999:90) mentioned that many subjects were heavily under the influence of Western curricula which, at the time, were categorized as "prized-curriculum packages". It took nearly 20 years to transform these former English-style schools to ones with a Malaysian outlook and using the national language and a Malaysian-oriented curriculum (Ahmad 1998).

In 1982, however, the Malaysian schools nationwide were subjected to a further revamp of the national curriculum. The primary and secondary schools had already adopted a new curriculum based on the Cabinet Report on Educational Policy Implementation in 1979. The objective of this reform was no longer to establish a national outlook but rather to replace a heavily-loaded, content-based curriculum (Mukherjee 1983), with one which set out to promote a child-centred curriculum which would embrace individual differences and abilities (Lee 1999), which would encourage participation and verbal communication in classroom activities (Ahmad 1998), and which would create in students pleasurable experiences in their schooling and in their learning (Mukherjee 1983).

This new school curriculum was known as KBSR (New Primary School Curriculum) and KBSM (Integrated Secondary School Curriculum). KBSR and KBSM laid down the fundamentals of a national curriculum which, with some extension and development, are still being used at the present time. KBSR mainly emphasizes the basics of reading, writing and arithmetic skills. Its progress has been continued by the creation of KBSM which offers core subjects and elective subjects to give students choices in the subjects they wish to study (Ahmad 1998; Lee 1999).

There are two levels, the lower secondary and upper secondary, in the current development of the secondary school syllabus in Malaysia. At the lower secondary level (age 13-15), there are core subjects and compulsory subjects which must be studied by all students and additional subjects which are offered in Government-aided schools (CDC 2006; Maimunah 2007).

The core subjects are the Malay Language, English, Mathematics, Science, History, Islamic Education (for Muslims), Moral Education (for non-Muslims) and Civics. The compulsory subjects are Geography, Physical Education, Health Education, Living Skills, Visual Art and Music, and other additional subjects which include a range of language subjects including Arabic, Chinese and French.

At the upper secondary level (age 16-17), the curriculum gives more flexibility to the student to choose a range of subjects dependent on their interests and capability. There are as many as 93 elective subjects on offer, (CDC 2006), in four different areas: Humanities, Vocational and Technology, Science and Islamic Studies (Maimunah 2007). The core subjects for upper secondary remain the same as those in lower secondary except the teaching is more detailed and comprehensive.

It is important to note here that all Muslim students are required to take Islamic Education as a core subject. At the same time they also can choose three other elective subjects in Islamic Studies such as Islamic Worldview, al-Quran and al-Sunnah Studies, and Islamic Jurisprudence. These three elective subjects are also offered to both Muslim and non-Muslims.

It is important here to acknowledge that the ongoing development of the curriculum in Malaysian schools is aimed at delivering the objectives stated in the Malaysian National Philosophy of Education (NEP) (A. Rahman 2007). This National Philosophy of Education (NEP) aims at fostering the holistic side of individuals in their intellectual, spiritual, emotional and physical development in order to produce a balanced, harmonious and responsible citizen who can foster the nation's hopes and aspirations.

The values underlined in the National Education Philosophy as shown below have been used in drawing up a national curriculum at all levels of the education system in Malaysia from the pre-school to the tertiary level:

> "Education in Malaysia is an ongoing effort towards further developing the potential of individuals in a holistic and integrated manner so as to produce individuals who are intellectually, spiritually, emotionally and physically balanced and harmonious, based on a firm belief in and devotion to God. Such an effort is designed to produce Malaysian citizens who are knowledgeable and competent, who possess high moral standards, and who are responsible and capable of achieving a high level of personal well-being as well as being able to contribute to the betterment of the family, the society and the nation at large." (MMoE 2007)

2.2 ICT Initiatives and the Establishment of Smart Schools in Malaysia

Clearly from the history, Malaysian school reform after independence in 1957 was focused on building national unity through the creation of national schools using the national language. It was followed by major reform of the curriculum in 1980s which was targeted at the development of a plainly Malaysian-style curriculum, reducing the content-based syllabus and working around the National Philosophy of Education (NEP) to produce well-balanced individuals and citizens.

Nevertheless, in 1999, Malaysian schools witnessed the beginning of another major reform in the creation of Smart Schools. The Malaysian Government has established Smart Schools to capitalize on leading current ICT technology (Frost 2004), to take advantage of the development of the Multimedia Super Corridor (MSC) (Chan 2002), and to transform Malaysian schools into technology enablers (MMoE 1997a). The Smart School initiative was created as a direct result of the establishment of the Multimedia Super Corridor (MSC) in 1996. The establishment of MSC itself was inspired by the long-term planning of the Malaysian Government's Vision 2020.

There was a belief among developing nations in the 1990s that information technology could be used as the main means of rapidly modernising and transforming themselves into developed countries (Warschauer 2003). This belief motivated a number of developing and middle-income countries in Latin America, Asia and Africa to invest in information technology. Many of them invested heavily in the education sector and adopted large programmes to introduce ICT into the schools' curriculum (Edwyn 2001; Frost 2004).

Educational institutions in Malaysia also recognized that the world has changed in the age of information technology. The creation of the Multimedia Super

Corridor and the announcement of the implementation of the SMART school by the Ministry of Education all over Malaysia has led to a call for the restructuring of our education system. The Smart School initiative is likely to change the traditional policies and practices of the curricula system, the educational delivery system and the educational evaluation system.

In January 1991, our previous Prime Minister, Dr Mahathir Mohammad, announced the Government's ambitious plan to become a fully developed country by the year 2020. This plan called Vision 2020 is aimed at accelerating Malaysia's shift to high technology industries in order to reach the standard of living of the industrialized countries. However, in order to achieve this ambition, Dr Mahathir Mohammad emphasized that we should do it in our way and "in our own mould" without duplicating or following solely the current developed countries (Mohammad 1999).

He outlined nine challenges upon the nation before we could achieve the status of a developed country which encompasses national unity and the development of moral and spiritual values. Lee (1999) said that education plays an important role to meet the challenges because education is perceived as promoting national unity and harmony which is very important for economic growth in the country. These objectives can be achieved by education, promoting shared and common values among the various ethnic groups and developing the use of a common language, i.e. the Malay Language, and providing equal opportunity in education.

Vision 2020 also made clear the importance of capitalizing on "high and modern technology." It said Malaysia must not "lag behind" in technology development (Mohammad 1999). One of the challenges outlined in the Vision 2020 was:

> "the challenge of establishing a scientific and progressive society, a society that is innovative and forward-looking, one that is not only a consumer of technology but also a contributor to the scientific and technological civilizations of the future".

Vicziany (2004) argued that there was no precise statement or clear indication in Vision 2020 on the importance of ICT and the establishment of MSC and Smart Schools. However, many believe and are convinced that Vision 2020 was the catalyst for the fastest development of ICT in Malaysia. Many literatures (Theaker 1997; Umat 2000; Belawati 2003; MSC 2005; Ya'acob 2005) affirm, in some way or another, a relationship between the creation of the Multimedia Super Corridor and Smart Schools with the launch of Vision 2020.

Chan (2002) said that the reason for promoting science and technology in schools is none other than to fulfil the nation's Vision 2020 which urges sustained productivity-driven growth by using technologically literate work forces. Theaker (1997) also said that the technology drive in Malaysia is tempered by the earlier concepts identified by the Malaysian Government in Vision 2020. Although ICT technology was not specifically mentioned, Vision 2020 clearly set out to pioneer a concept of Malaysia capitalizing on the use of the latest and leading-edge technology.

In order to encourage the development of ICT in Malaysia, the Multimedia Development Corporation (MDeC) has been entrusted to coordinate the overall implementation of these flagship applications in the Multimedia Super Corridor initiative (MSC 2007). The Government has identified seven areas to spearhead the implementation of its ICT flagship applications: Smart Schools, Electronic Government, Telemedicine, Multipurpose Cards, R&D Clusters, the World-wide Manufacturing Web and Borderless Marketing.

One of the reasons for the establishment of Smart Schools is to provide human resources and knowledge workers for ICT companies and industries for the next 13 years. The Malaysian Government, therefore, has outlined several important strategies to improve human resources in ICT which involve long-term planning to upgrade the quality of the current education system in primary and secondary schools and a key element in this planning is the establishment of Smart Schools (EPU 2002).

Mustapha (2004) said the establishment of MSC and the establishment of international ICT companies in the MSC has increased the demand for knowledge workers in IT industries. Concerns have been expressed about the lack of such workers in the MSC and the need for human resources in the future (EPU 2002; Mat Nor 2007). Hitherto, the Government has had to attract highly skills foreign workers to fill the vacuum in MSC (MSC 2004).

2.3 Educational Change in Smart School Initiatives

Clearly, the MSC project has created the initiative to establish Smart Schools all over Malaysia. The Smart School is an ambitious project in the education sector in terms of financial investment, human resources investment and other related investment. The Smart School was created to change traditional attitudes and approaches to teaching and learning policies and practices, and to update education's current curricula, delivery and evaluation systems (MMoE 1997a; Bajunid 2000; Konting 2003; CDC 2004a).

Bajunid (2000) said that educators in Malaysia are being challenged as never before by the megatrend initiatives in ICT by the Malaysian Government. Mega development projects like the Multimedia Super Corridor have created fundamental changes in the infrastructure of and systems in Government entities including the education sector. The MSC initiative has forced these entities to think afresh about their current situation and their plans on future policies and practices. The Smart School blueprint (MMoE 1997a) stated that the new concepts on teaching and learning in Smart Schools should be fully implemented in 10,000 schools throughout Malaysia by 2010.

The implementation of Smart Schools' policy will guarantee students in Malaysian schools the right of access to a system of education that uses advanced technology in ICT (Bajunid 2000; Frost 2004). Consequently, it will change the current school curriculum (MMoE 1997a), the teacher training curriculum

(MMoE 1999) and the curriculum for educational management training (MMoE 1999).

Another major impact on the curriculum is the need to master an international language, especially English, in order to have access to information available on the Internet and to reach out to the outside world. Starting from 2003, the Government has imposed English as the medium of instruction in teaching Mathematics and Science in all schools in Malaysia (Maimunah 2007).

The Smart Schools blueprint (MMoE 1997a) indicated that the Smart School was driven by the need for Malaysia to make the transformation from an industrial to an information-based economy. This will call for our education system to produce knowledge workers and IT literate workforces which are able to work in IT industries and to perform well at the local and international level. The lack of knowledge workers with skilled, dynamic, creative and innovative human resources forced the Malaysian Government to launch a campaign in the year 2000 to attract 5000 high skilled foreign workers to Malaysia (Mustapha 2004).

Therefore, it is not difficult to understand that the most important reason which led to the existence of Smart Schools was "to prepare children for the Information Age" (MMoE 1997a: 2), so that the nation can advance confidently towards a developed country by year 2020.

2.3.1 The Impact on Teaching in Smart Schools

Bajunid (2000) said that teachers in Smart Schools have been engaged in examining new possibilities in teaching and learning process. New terms are beginning to occupy the minds of teachers. The terms like 'self-directed learning', 'self-access learning' and 'self-paced learning' will dominate and change long-time teaching practices in the classroom (CDC 2004).

The role of teachers in Smart Schools is also clearly different from their traditional role in Malaysian schools. Traditionally, their role was more on knowledge transfer in the classroom where they took full command in the instructional process (Ahmad 2005). The learning process was totally dependent on the teachers who determined all the teaching content and the organization of the teaching structure. Bajunid (2000) described the traditional Malaysian teachers as the sage on stage who possesses full authority in the classroom and dominates the whole process of teaching and learning.

The teaching was dominated by lectures and talk, in the form of one-way communication. Research (Ahmad 2005) shows that Malaysian teachers still dominate and are comfortable with the traditional form of teaching which was based on textbooks, teaching notes and the blackboard. Teaching and learning strategies have traditionally been based on textbooks so this is not a new problem in the Malaysian educational system. However, in a major reform of the curriculum in 1982, the Ministry of Education began the process of reducing this dependency on textbooks (Mukherjee 1983).

Education Minister Razak (1999) said that the teacher training program would be changed in all aspects as teachers in the future will not function as providers of information but rather as facilitators of teaching via computers. Yaakob (2005:5) said that Smart School teachers were required pedagogically to be "guides on the side", guiding students in their learning, allowing them to learn at their own pace, providing psychological support and encouragement, creating conditions that promote self-directed learning, and teaching students application strategies to navigate competently and selectively for information.

Teacher development will be a critical point in the success of the Smart Schools and an intensive training in the use of information technology and its integration into classroom activities are crucial for their success. The Smart School Benchmark report has recommended that teacher training is a top priority in Smart Schools to keep the teachers in step with the rapid changes in technology (Frost 2004). Many researchers have suggested that, in the long term, these teachers will need to practise their skills regularly to remain confident in the application of the technology in front of a class (Mumtaz 2000; BECTA 2004)

The Ministry of Education started a forerunner teacher training initiative for Smart Schools in December 1996, which led to the production of "Master Trainers" (MMoE 1999). A training model called "Cascade Model" has been used with 2 cohorts of selected teachers who were selected and trained by university lecturers who were specialists in IT. Up to December 1998, 2318 master trainers have been produced through this model. Once they have successfully completed their training, these master trainers are each made responsible for training 20 other teachers from 20 different schools. The training curriculum for master trainers is focussed on integrating computer use with teaching and learning, using software and designing sample software. training other teachers, and inculcating positive attitudes (MMoE 1999)

A training program for all Smart Schools teachers was started in 1998 according to the Smart Schools Implementation Plan (MMoE 1997b). This training was conducted in two phases. The first concentrated on generic skills including thinking skills, study skills, facilitating skills and computer skills. The second phase concentrated on pedagogical skills and on expanding the teachers' repertoire and experience in using technology effectively. (MMoE 1999). The programme also trained teachers in management tasks such as keeping student records, preparing lesson plans and materials, grading students' assignments, and compiling student grades in a more efficient manner with the use of various instructional technologies (MMoE 1999).

2.3.2 The Impact on Learning in Smart Schools

In the blueprint of Smart Schools (MMoE 1997a), a Smart School has been defined as an innovative learning institution to help students cope with the future Information Age. Smart Schools have revamped the traditional learning processes relating to curriculum, pedagogy and assessment to help students learn more effectively and efficiently.

The most distinguishing features of Smart Schools as compared to other schools are the use of technology to support and enhance the learning process. With the aid of multimedia technology, the Ministry of Education believes that students will be encouraged to gain access to learning materials by themselves and be independent from their teachers (self-accessed), to learn according to their own pace and capability (self-paced), and to explore topics of interest without being tied down to a rigid syllabus (self-directed learning) (MMoE 2003).

Concepts of learning in Smart Schools have moved away from the traditional. No longer are they teacher-centred, fact-acquisitive, and based on rote learning. All these traditional concepts have been replaced by student-centred learning, active knowledge construction and critical and creative thinking (Yen 2005).

The Ministry of Education has placed the emphasis on producing a new breed, a creative generation that has moved away from memory-based learning. The new curriculum has been designed to stimulate thinking and creativity without neglecting individual abilities and learning styles. The Malaysian curriculum was formerly well known for being exam-centred but this new concept of learning has been designed to reduce this problem and to optimise students' potential and abilities without being too tied to examinations.

2.3.3 The Impact on National Curriculum

The Smart Schools' curriculum has been designed to help students achieve an overall balanced development which reflects the continuity of our National

Philosophy of Education aim (MMoE 1997a; Chan 2002). The new curriculum also continues the previous efforts to promote national unity and to develop a sense of social responsibility in a multicultural country. In response to the onward advance of technology and globalization, the Smart Schools' curriculum focuses sharply on ICT technology. To this end, the Malaysian government is laying great emphasis on education and human resource development so that the country can advance as a developed nation capable of competing in the global economy.

The intended outcome of these changes is to ensure that the curriculum will afford equal access for all students to quality learning while catering across grades and classes for individuals with differing needs and levels of ability. The curriculum has been divided into three levels according to student ability. Every student should master all lessons at level one. Level two should be attainable by most of the students, and level three has been developed to challenge the capability of high achieving students (MMoE 1999).

The characteristics of the Smart Schools' curriculum are multidisciplinary, interdisciplinary, thematic, and continuous across learning areas suitable for the Information Age. A multi-disciplinary approach combines two or three subject areas into a single learning area that focuses on a theme, issue, problem, topic or concept. An interdisciplinary approach combines all subject areas to focus on a selected theme, issue, problem, topic or concept (MMoE 2003). This curriculum also promotes an integration of knowledge, skills, values and the acquisition of an international language across the curriculum.

2.3.4 The Impact of Technology in Smart Schools

The rapid growth of ICT has led to innovations and new applications of methods and instruments in teaching and learning in Smart Schools. In these schools, the use of IT is being implemented not only in the teaching and learning process, but also in school governance. The use of technology is also envisioned to promote interaction between the school community itself, other local schools, parents and the local community. This can be achieved using Smart Schools Integrated Solution (SSIS) which was developed by the Telekom Smart Schools Company (TSS)

Research by Frost & Sullivan (2004) which compared SSIS with systems in eight other countries found that the SSIS system was unique and exceptional in the sense that no other country has attempted to implement a complete suite of solutions in schools like the SSIS. SSIS has five main components:

1. Smart Schools Management Systems (SSMS): a comprehensive application software system developed to facilitate an efficient management and an effective administration of resources.
2. Teaching and Learning Materials (TLM): Multimedia software based as teaching and learning materials which were developed to complement the existing textbook-based approach. Tailored in accordance to the national education curriculum, the TLM is considered as the heart of the Smart School software.

3. Technology Infrastructure (TI): The technology employed within the Smart School infrastructure involves the integration of hardware, software, systems software and non-IT related equipment, running on both the local and wide area network for communications with internal and external constituencies.
4. System Integration (SI): The Systems Integration works within the Smart School Pilot Project to ensure smooth operational status between the above components and to integrate with other flagship applications in the Malaysian Super Corridor (MSC).
5. Support Service (SS): including Help Desk and Support and Maintenance Services. The Help Desk is a single point of contact for IT coordinators in schools to obtain technical guidance and problem resolution.

Sources from: (Chan 2002; Konting 2003; Frost 2004; MSC 2005)

2.4 Smart School Pilot Project

The Smart School pilot project was started in 1999 based on a conceptual blueprint produced by the Ministry of Education (MoE) and the Multimedia Development Corporation (MDC) in 1997 (Frost 2004). This pilot project involved 87 schools all over Malaysia (3 schools dropped-out). These schools formed the nucleus for piloting the use of materials and technologies which could then be employed in the next roll-out phase of Smart Schools (Chan 2002). Eventually, this initiative will have been rolled-out nation-wide so that by 2010 all schools will be Smart Schools.

Chan (2002) said that the objective of the establishment of Smart Schools is to achieve the aims of the National Philosophy of Education (NEP) while at the same time preparing a workforce fit for the 21st century. It is important to transform current practices away from memory-based learning towards more creative and critical thinking learning as well as to give students greater responsibility for their learning. The Smart Schools' initiative is not only to be confined within the confines of the school but also to seek participation from parents and the wider community (MMoE 1997a). The Ministry of Education believes that the advanced technology of the computer and ICT can help them achieve these objectives.

The use of new technology in computers and ICT is one of the main pillars of the Smart Schools' initiative. This pilot project was used to test the effectiveness of the component which is at the heart of the Smart Schools' innovation, namely the Smart Schools Integrated System (SSIS). SSIS is claimed as one of its kind for school management solutions (Frost 2004; MSC 2005) and one of the most important parts of SSIS is Teaching and Learning Materials (TLM). 1494 titles of software for English, Mathematics, Science and Malay Language have been produced in 3 years for teaching and learning purposes in Smart Schools. Three levels of computer technology models were tested in schools: one, a computer laboratory model (Level B), two, a limited classroom model (Level B+), and 3, a full classroom model (Level A) (MMoE 1997b; MSC 2005).

There was some concern at the beginning of the pilot project that it would be restricted in its use to schools for the elite and the privileged, especially when only 90 schools throughout the whole of Malaysia were initially selected. However, the then Minister of Education, Mohd Najib bin Abdul Razak, (1999) said that Smart Schools were not meant only for the elite or the super achievers but eventually for the use and benefit of all schools and all Malaysians to enable the country by 2020 to face up to the challenges and demands of a developed nation.

The implementation of the pilot project from 1999 to 2002 was closely monitored by three parties: the Ministry of Education (MoE) as the supreme authority in the Malaysian education system; Telekom Smart Schools (TSS) as the software developer; and the Multimedia Development Corporation (MDC) as the main instigator for the Smart School flagship (MSC 2005).

2.5 Islamic Education in Malaysian Schools

Islamic Education is a compulsory subject at all levels in Malaysian schools from primary schools to upper secondary schools. This is in line with the status of Islam which is the official designated religion of the Federation in the Malaysian constitution (Ahmad 2005). Islamic Education was formally taught in Malaysian schools after the implementation of the 1961 Education Act (Baba 2006). According to the Act, Islamic Education should be taught in a school if there are 15 or more Muslim children at that school (Yusoff 2006). This shows the significance of Islamic Education in the Malaysian education system.

Islamic Education in primary schools emphasizes Quranic reading skills, the basic foundation to understand Islamic beliefs (Aqidah), Islamic law and rules (Ulum Syari'yah), and the principles of Islamic characters and manners (Akhlak Islamiyyah). These are obligatory knowledge (Fard A'in) on every Muslim who is mature, healthy and sane (CDC 2006).

Meanwhile, in secondary schools the students are taught in-depth knowledge of:

- al-Quran (the Holy book) including commentary and exegesis of al-Quran;
- the skills to read al-Quran correctly and beautifully (Tajweed and Tarannum);
- Islamic faith and creed according to Ahli Sunnah Wal Jama'ah understanding (the mainstream and the largest of the Islamic sects);
- Islamic jurisprudence (Usul al-Fiqh) to understand how rules were derived from al-Quran and al-Sunnah (the prophet's deeds, sayings and approvals);
- the biography of the Holy Prophet and the prominent figures in Islam; and
- the manners and characters of good Muslims (Adab and Akhlak)

Source from (JAPIM 2006)

2.6 Summary

This chapter provides an overview and brief summary of the history of educational change in Malaysia. It is very important to understand this history in order to understand underpinning changes in Smart Schools. This chapter explains the chronology and relationship between past changes and innovations in Malaysian schools starting with the initiative to establish one single type of national school for all ethnicities up to the present initiative of Smart Schools.

The literature shows that the latest change was initiated by the strong need to take advantage of cutting-edge technology in ICT. The Smart School initiative was created as a direct result of the establishment of the Multimedia Super Corridor (MSC) in 1996, to provide knowledge workers for MSC in preparation to become a developed country in 2020. The implication of this is that the Smart School changes were dominated by the initiative to incorporate technology in all aspects of the curriculum, the school management and teaching and learning. This chapter also explains how Islamic Education fits in our educational system in general and in Smart Schools in particular.

Chapter 3 Literature Review

3.1 The Importance of Teachers' Views Regarding Educational Change

The reasons for studying teachers' and students' views are grounded in the assumption that these views have a significant influence on any attempts to implement major changes successfully in schools. Many studies suggest that any educational change at schools should take into account the views of teachers (Fullan 1992; Fisher 1999; Harris 2001; Kirk 2001; Hess 2002; Crawford 2003; Flores 2005) and the views of students (Hess 2002; Quicke 2003; Riley 2004; Rose 2004; Wall 2005).

The views and attitudes of teachers toward educational change in their school may lead to their positive or negative reactions and practices in the classrooms. As a result of clashes with the teaching profession over the changes involved, studies showed teacher motivation waned. Teachers' motivation waned after the implementation of changes which they perceived as clashing with their personal attitudes, views and knowledge (Kirk 2001; Crawford 2003; Flores 2005). There is always the chance that implementing change will affect teachers' motivation. Thus, many studies have suggested continuous support and ongoing opportunities for professional development should be undertaken to ensure the initial motivating effect of a new change is maintained (Crawford 2003; Flores 2005).

Teachers are at the heart of any education change and ultimately it is they who have the power to ensure whether change is implemented successfully or not in the classroom. MacPhail (2007) showed that tensions and conflicts can happen when teachers' interpretations and reconstructions of change differ from the way they are expected to be delivered. MacPhail said that it is vital and important to understand teachers and school conditions that strengthen or weaken the efficient and effective implementation of any curriculum change.

School conditions and supports are vital to the progress of change in the views of teachers. Hess (2002) said that the environment of a school influenced teachers' attitudes towards change in various types of schools. His study found that teachers working in negative and unhelpful public school cultures were more likely to choose employment in a private school, and that the declining quality of public schools to some degree may contribute towards their support for alternative private schools.

Teachers need clear information and guidance in implementing educational reform. Flores (2005) said teachers claimed a lack of information, training and resources that clearly illustrate the role and task expected from them. Teachers complained that their notion of professionalism was compromised by the unclear position which resulted from the new educational reform. Clearly, uncertainty, ambiguity and lack of understanding of changes imposed on them made teachers resist change initiatives. Personal experience with schools can influence personal views towards schools' reform initiative.

Many researchers have found that teachers were fearful to change and more comfortable with the present conditions. Harris (2001:27) found that teachers involved in Hong Kong education reforms were reluctant to change and preferred the status quo for fear of "losing face" in front of students. Dignity and authority for teachers is an important value in traditional Chinese custom and teachers would not like to take the risk of moving away from the traditional approach. Consequently, not many teachers are ready to abandon the normal and long-time classroom practices. This attitude is echoed in Malay culture which emphasizes on the credibility and the pride of teachers in their classroom.

In many cases, young people tend to be more responsive to educational reform than the older generation. Hargreaves (2005) found that older teachers have a tendency to resist changes in schools and challenge the outcomes of change whilst the younger generation of teachers coming straight from teacher training welcome change because they have learned the outcomes of change taught to them at university. Hargreaves' studies have confirmed the findings of many other previous studies that age, career stage and generational identity do have an impact on how teachers respond to change in schools.

Even though teachers are always associated with resistance towards change, some studies found that some teachers were positive and welcomed changes. Fisher (1999) found that many major concerns and criticisms of the National Literacy Strategy in the UK were not a problem and did not affect the teachers in his study. The outcome of his survey was more positive than he anticipated when teachers responded positively towards critics' point of views like literacy hour structure, resources provided, greater emphasis on literacy and shared text work. This shows that in some circumstances, teachers appreciated and welcomed changes when they thought the changes suited them.

Education change is not an overnight job and it should be done in a gradual and continuing process. Harris (2001) suggested a transition phase to deal with emotional and social issues relating to change. She said that experiential learning before any reform takes place can help teachers to experience the future tensions and dilemmas within the change process, enlightening teachers with insight problems, thus enabling them to take more control over the change process when the time has come. Obviously, educational change is not an easy task because teachers have to change their behaviours and practices in classrooms and it takes ages to accomplish (Hargreaves 2005). The change is unlikely to occur unless the deep rooted practices in classrooms are changed.

3.2 The Importance of Students' Views Regarding Educational Change

Fullan's (2001) study cited that the success of educational change in schools depends on what teachers do and think. Teachers are ready to change and respond positively, if they feel and think that the change is necessary and really needed. The same principle should apply to the students because they always feel left out and rarely think of themselves as participants in a process of change (Fullan 2001). Therefore, it is very important to carry out a students' and teachers' needs assessment and analysis as precursors to the planning of change.

To date, little research has sought directly the views of pupils as compared to those which have reported the wide range of teachers' views on problems in educational change. There is a doubt that students have the maturity, skills and experience to review the problematic situations and complicated relationships in schools. However, many researchers have urged the need to empower students and listen to them more (Fielding 2001; Rose 2004; Blossing 2005; Schratz 2005; Wall 2005) especially regarding local change initiatives that are related directly to them in classrooms.

The current practices in school environment do not favour students and their involvement is not taken seriously. Many studies offer suggestions to improve students' involvement like changing the existing discourse of teaching, learning and organization (Schratz 2005), creating an opportunity for them to express their concerns (Rose 2004), finding alternative communication mechanisms to improve their voice (Fielding 2001; Schratz 2005), directly involving them in any disagreement resolution with authority, and improving the current legislation regarding children's rights (Soar 2006).

Most of the time, students have their own views and their own needs on particular issues in education and at the end of the day, it is the students' own interest and attitudes that will really count to them in their learning. Schratz (2005) showed the differences between official standardized curriculum questions and those questions by children in practical daily life schooling. The purpose of a typical standardized school question is seek to convey functional knowledge for surviving challenges in life which are already known by students. In his study Schratz found there were distinctions between standardized learning questions in the curriculum and daily life questions when students get involved in a learning project. Students were more concerned with their own interests in discovering the unknown world than answering the standard school questions.

One of the simple logics to listen to students on change is because they are simply the majority in schools and it is undemocratic to not listen to them. The central issues are power and authority, freedom and equality, and the values of democratic living (Fielding 2003). In Sweden, Blossing (2005) found that teachers rarely got responses from school leaders and other adults. Instead it was students who expressed more opinions and shaped the outcomes of improvement efforts. The students possess vast knowledge of daily school life from their daily observations and monitoring, therefore decisions about school change should be shared equally among the majorities in schools i.e. both the teachers and the students.

Listening and consulting students regarding issues which affect their lives is protected under the United Nations Conventions of the Rights of the Child (Rose 2004; Wall 2005; Soar 2006). Soar (2006) said that recent legislation by SEN Code of Practice UK has protected students rights to have their voice heard from making decisions to setting learning targets, choice of schools, in assessment of their needs, their involvement in transition planning, and their direct involvement in any disagreement resolution. Clearly, the need to listen to students has become more obvious and in some countries, like UK and Republic of Ireland (Riley

2004; Rose 2004) appropriate measures have been taken to change legislation and policy documents.

Research has found that by allowing students to express their views will benefit all including students, teachers and school authorities. Rose (2004) noted the following benefits of student involvement; students are more accurate in their judgments, their self-confidence and awareness increases, there is a significant impact on teachers work, school staffs gain understanding of their students' needs, and students become more respectful and collaborative with school cultures.

In many cases, research has found that the views of students differ from the views of teachers and school authorities. Riley (2004) showed that teachers over-estimated the extent to which students liked schools and their interests in learning. Furthermore, teachers underestimated the values attached to school works, support over homework, bullying and student safety, skipping lessons, attendance at parents' evening and unauthorized absence. Hence, by listening to the views of students and engaging in mutual dialogues teachers and students will improve their understanding of one another.

3.3 The Failure to Embrace the Teacher and Student Voice in Large-Scale Education Reform

For the past two decades many countries in the world have attempted to change their education system using large-scale projects. Fullan (2002) said that people are no longer satisfied with individual change innovativeness in schools and that the new era of education reform will be more geared towards large-scale and sustainable reform. In addition, Leithwood (2002) believes that economic conditions, dramatic swings of political ideology and leadership, and social values have caused this new phenomena.

There are many types of large-scale school reforms and the most common and trumpeted type is the nation-wide reform. Fullan (2000a) categorized large-scale reform into three categories; first, school reform in one district; second, hundreds of schools implement particular change models; third, state or national change initiatives. Fullan (2000a) said it takes 8 years to reform schools in one district and there is no evidence to suggest how long it would take to accomplish a nation-wide reform. Stringfield (2002) said that to successfully reform up to 1000 schools would need the formation of a highly professional core group and specialized infrastructure.

Large-scale reforms not only involve large numbers of schools but they are multi- dimensional with many aspects of innovation. Fullan (2001) said there are three main aspects of change commonly implemented in any large-scale reform initiative: first; the new revised materials such as curriculum materials and technologies; second, a new approach to teaching strategies and activities; third, a new concept of beliefs and pedagogical assumptions which are the most difficult aspect of change. In this case, the Smart School initiative clearly was a major reform that involved all three important aspects of teaching and learning i.e. learning materials, pedagogical practices and beliefs (MMoE 1997a; MMoE 1997b).

Large-scale school reforms are mostly initiated by states and use a top-down approach. The most common problem with using a top-down approach is the poor level of teacher and student participation and hence it is less well received than using a bottom-up approach. Ravn (2002) compared the impact of educational change in Denmark, France and UK between 1998 and 2002. She found that a bottom-up approach is more flexible, contextually oriented, inter-disciplinary, and heavily dependent on teachers and students. In her study, Denmark was found to have successfully used a bottom-up approach and regularly consulted schools and teachers in the process of change. However, France and the UK used a more top-down approach. The Danish children were found to have had the most positive feelings about school and teachers whereas the English students appeared as less receptive towards change and the least enthusiastic about their schools.

Some studies found that the top-down approach has a potential to thwart the good ends intended for the particular educational change. Selden (2004) said that NCLB (No Child Left Behind) in the US, the central federal reform effort to improve educational services for disadvantaged children, had failed to improve their achievement, with the remaining gaps between disadvantaged children and others still very large. Selden argued that such top-down high expectations are unreasonable for teachers and schools, and that there is a potential for frustrating and demoralizing results when teachers do not respond in a constructive, enthusiastic and responsive manner as anticipated. Clearly, this approach potentially invited counter-productive responses from the teachers and despite its noble objectives, damaged the intended change.

Many researchers suggest that a top-down approach can be combined with a bottom-up approach to maximise the effort of change (Fullan 1999; Leithwood 2002; Caldwell 2004). Leithwood (2002) in his framework for large-scale reform suggested that a combination of policy changes be implemented with local initiatives in schools to address local challenges such as motivation, work capacity and work setting. Caldwell (2004) suggested a reconciliation between Government objectives and the individual school's aims on educational change. He suggested a bottom-up change through a decentralization approach with more self-managing schools being authorised at the same time as the Government played an active role in setting policies, goals and standards. This balanced approach of centralization and decentralization was approved in an Education Ministerial Meeting of APEC (Asia Pacific Economic Cooperation) in 2004 (Caldwell 2004).

Lack of participation in the process of change may contribute towards a lack of engagement and involvement of teachers. Ravn (2002) found that Danish teachers were more satisfied with educational change in their country as a direct result of their involvement using bottom-up educational change initiatives while English teachers were more stressed to meet Government standards and felt overworked and overloaded. This shows that in order to implement change the teachers need to engage actively in the change process and feel ownership of change.

Lack of involvement in the process of change may contribute towards a lack of clarity over the changes' aims and haziness in the vision of change. Fullan (2001) said that clarity about goals and means of change is a major and perennial problem in the process of change as teachers may not be at all clear what they should do differently. Fullan said that we should anticipate greater problems on clarity when more complex change is implemented and sometimes participants are left with false clarity when the change is interpreted in a more superficial and oversimplified way than it should be. This can cause anxiety and pressure in the implementation process when the participants realize that the proposed change has more to it than they thought.

However, Louis (2007) found that teachers were willing to accept the change's vision if the process of initial planning and the quality of program management was fair for them, even if they were not consulted at the initial stage. Louis's study found that the administrators' interpersonal behaviours with staff and their administrative skills and competency were very important and the key issues underpinning teachers' trust with the complex change initiatives. The integrity of administrators in implementing the change process from the beginning is very important to avoid teachers' suspicion and resistance to change.

Policy-makers should have a greater awareness of the self-reform ability in schools before suggesting any reform and this can be done by talking to teachers and students. Failure to identify a local school's ability may affect the reform agenda as a whole. Giles' (2006) longitudinal study on two innovative schools between 1970-1990 showed the failure of reform initiatives when policy makers insisted on implementing an inflexible top-down approach with narrowly defined reform models. Giles said that such inflexible approaches were implemented because of the mistaken assumption by policy-makers that the schools involved in the project had little capacity to do self-reform.

Lack of teachers' participation in the change process causes resistance to change (Weller 1996; Fullan 2000b; Giles 2006). Weller (1996) identified five areas to be addressed to ensure the success of change in schools: teacher participation to build commitment and change ownership feeling, communication and updated information about change to reduce teachers' anxiety, involving influential teachers in planning change to gain support, support from top administration for teachers' concerns, and payoffs for teachers' involvement in change. Teachers' exclusion from the change process can develop pockets of resistance and jeopardize the sustainability of change.

It is indeed, very difficult to accomplish large-scale, national-wide, and top-down reform programs, and Farrell (2000) cited that most centrally planned and directed large-scale educational change has either failed or succeeded only partially. He reminds the danger in implementing one-size-fits-all policies to fix a complex educational problem which could potentially lead to failure. Even accomplishing a humble educational change needs long hard work with unpredictable results. It frequently happens that the process of educational reform takes far longer than originally anticipated and continues beyond its original plans (Selwyn 2001).

3.4 ICT and Technology Change in Schools

In Malaysia, there has been strong pressure to use information technology widely in the teaching and learning process. The implementation of Smart Schools in stages from 1999 to 2010 was an attempt by the Government to ensure all Malaysian schools had access to advanced technology in ICT (Bajunid 2000; Frost 2004). Consequently, it has changed dramatically the current teaching and learning strategies (Bajunid 2000; Ya'acob 2005), the current school curriculum (MMoE 1997a), the teacher training curriculum (MMoE 1999a) and the educational management training (MMoE 1999a).

Despite huge funding from the Government to transform schools in Malaysia through technology, the classroom is still driven by lectures, textbooks and conventional teaching methods (Ahmad 1998; Lee 1999; Bajunid 2000; Konting 2003; Ahmad 2005). Research by (Ahmad 2005), showed that Malaysian teachers are still dominated by and are comfortable with the traditional form of teaching which is based on textbooks, teaching notes and the blackboard. Teaching and learning strategies based on textbooks are not a new problem and many initiatives have been taken to reduce dependency on textbooks in the major reform of the educational curriculum in Malaysia (Mukherjee 1983).

ICT policy in schools has been implemented by many countries for almost two decades and a great deal of research has been carried out into large-scale educational change involving ICT technology (Fullan 1992; Hampel 1996; Selwyn 2001; Hinostroza 2002; Konting 2003; Warschauer 2003; Yuen 2003; Harrison 2004). Many research evaluations have suggested that the impact of ICT on learning in such large-scale programmes was not great and rarely justified the major investment of money, time and human resources to promote ICT in schools (Cuban 2001; Condie 2002; Hinostroza 2002; Mentz 2003; Reynolds 2003; Robertson 2003; Warschauer 2003; Yuen 2003). Andrews (2004) even suggested that policy-makers should refrain from further investment in ICT until at least one large and rigorously-designed randomised trial has proved its significant contribution.

ICT policy in schools remains a debatable and contentious issue amongst researchers particularly when it comes to learning achievement and its implementation process on the ground. Reynolds' study (2003) compared three different perspectives on ICT in schools. First, the optimist-rhetoric by Government authorities and their agencies who believe that the achievement of schools with good ICT resources is better than schools with poor ICT resources. Second, the pessimist rhetoricians who are opposed to any form of ICT in schools based on their ideas on how children should develop and the basic needs of children to interact with others and with the natural world around them. Third, academicians who suggest that classroom learning should focus on learning with technology but not about the technology, and that ICT should be utilized as any other tool with which to teach the syllabus in the classroom.

The reality of ICT use in schools was completely different from what teachers had imagined and believed. Many researchers found that, in reality, teachers were using ICT resources less and less in their classrooms (Cuban 2001a; Kitchen 2003). Kitchen (2003) found that secondary school teachers were less likely to use ICT compared to primary school teachers and 40% of them never used subject specific software and Internet resources. Cuban's study (2001a) conducted in the heart of technological progress in Silicon Valley, California, surprisingly found that there was a general reluctance for the use of ICT among teachers. Two-thirds to three-quarters of them were categorized as non-users who never used the ICT centre or its resources in schools.

Many researchers have mentioned the importance of positive attitudes and mindshifts to ensure the success of technology change in schools (Cuban 2001; Robertson 2002; Cuban 2004b). With the emergence of more and more fresh challenges in teaching, especially the use of new technology, teachers need to give up long-held assumptions and practices, and replace them with a new mindset and new behaviours (Fink 1998).

Some studies show that teachers' positive attitudes toward computers are positively correlated with their experiences. One of the most common reasons for their negative attitudes toward technology is their lack of knowledge and experience in this area (Christensen 1997; Russell 1997; Mumtaz 2000; Garland 2005).

Despite the many difficulties in implementing ICT in schools, research also shows that teachers welcome ICT policies in schools and believe the technology could be useful in raising standards in teaching and learning (BECTA 2001; Kington 2003). Harrison (2002; 2004) found that there were statistically significant associations between higher level ICT use and pupil achievement in Maths, Science, English, Modern Languages and Design Technology. Nearly ten years after the first study, ImpaCT2 proved that ICT use had contributed toward improvement in subject-based learning. However, Andrews (2004) said that these associations were very small to justify and draw a conclusion of ICT effects on learning.

Ilomaki (2004) found that ICT used to support activity in the classroom was appreciated by teachers. The use of ICT had encouraged them, diversified their methods of teaching, not only changed radically their conceptions of teaching and learning but increased their motivation. Research by Young (2003) revealed that the Internet was very useful in providing a less stressful environment for the students to express their opinions and thoughts freely. Students were excited with discovery and exploration learning in a non-stressful setting.

3.5 Resistance towards Technology Change in Schools

In all the pressure for technology change, however, those forces which threaten the sustainability of change, such as teacher resistance, have been forgotten (Fink 1998). Over the past 15 years, teachers in Malaysia have been swamped by innovations in educational visions and curriculum change (Mukherjee 1983;

Ahmad 1998; Lee 1999; Bajunid 2000; MMoE 2006; Maimunah 2007). Since teachers have largely been left out of policy discussions, resistance is a natural and predictable response.

Previous studies show that resistance was synonymous with teachers' attitudes towards change. Even though they were creative and risk-takers in their daily classroom activities, research proved that they were also very protective on subject matters and very vocal on changes which they perceived as threatening their ability (Kirk 2001; Fink 2003; Flores 2005; Hargreaves 2005; Giles 2006).

Researchers have categorized teacher personality differences toward change in several ways ranging from personalities with conservatives views who prefer the status-quo in a personal comfort continuum, to those who are open, pro-active and enjoy the adventure of change (Fullan 2001; Flores 2005; Hargreaves 2005). Hargreaves (2005) found that older teachers tend to resist change and younger teachers tend to take on any change to keep their job and career.

Teachers who are likely to embrace technology are those who are willing to try new ideas in the classroom as well as in their personal life (Baylor 2002). When they were provided with the opportunity to learn new technology skills and techniques, they grabbed it and thus increased their competency. Cuban in his 2001 study found that teachers who inclined towards technology use in schools were avid home-computer users themselves and believed in the future ubiquity of computers in society.

Cuban (2001a) believed that there was no inherent reluctance to use technology or technophobia among teachers as generally cited in the literature. He also found that teachers' age, experience and gender were not related to their lack of use of or attitude towards ICT. He emphasized school context problems like time constraints, school structures and flawed technology in schools to explain teachers' reluctance to use ICT. Teachers were reluctant to change their existing practice because of contextual factors rather than individual hostility towards technology.

3.6 Barriers and Obstacles in Implementing ICT and Technology in Schools

3.6.1 Lack of Resources and Access

A lack of ICT resources is a prevalent problem in schools according to the BECTA (2004) report. This lack, the report said, was either because schools simply did not possess them, or because those that were available were of such poor quality that they were not worth using. There was a huge difference in ICT resource availability between the developed countries and the other countries. In developed countries like the UK, the USA and Australia, schools were well equipped with ICT resources and had well developed infrastructures. The impact of spending on ICT resulted in a significantly low computer-to-students ratio, a rapid increase in the levels of use, fast Internet connection speeds and increasing technological support in classrooms in the form of interactive white boards and digital projectors (Prior 2004; BECTA 2005)

However, research shows the opposite effect happening in some countries. Data from the Organisation for Economic Cooperation and Development (OECD) shows that the ratio of computers in some countries was one to 25-40 students (Drenoyianni 2006; OECD 2006). Pelgrum (2000) found that many countries in central and middle Europe still lag behind in terms of computer availability with a ratio of 1:100 students. Clearly, based on such a ratio as that, incorporating ICT within a classroom would be practically impossible.

In general, it can be said that research shows there is indeed a lack of resources in schools (Cuckle 2002; Barton 2006). Research by BECTA (2004) showed that 20.8% of respondents agreed that inadequate resources were among the barriers preventing teachers from gaining access to ICT. Yet lack of access is a complex and not a straightforward problem for there are many factors such as time constraints, heavy workloads, school structures and inadequate skills and knowledge to complicate the issue (Williams 2000; Cuban 2001; Tearle 2003; Drenoyianni 2006).

Indeed there is a considerable chance that teachers may find it impossible to access ICT if there is a clear lack of resources within their school. Zhao (2002) found that innovation projects in schools suffered significant delay or complete failure when there were no technological resources close enough to allow their use. Barton (2006) found that the lack of resources was top of the barrier list preventing ICT use. The respondents said ICT use in day-to-day teaching was problematic and Internet-based projects took several days to complete. Galanouli (2001) found that trainee teachers in schools were disappointed and adjustment difficult when they encountered lack of appropriate equipment which they had had at university.

Among the key findings of Tearle's study (2004) was the recommendation that easy and flexible computer access be a priority if the computer was to be incorporated into every-day teaching. Teachers should be allowed to access the resources they need, when they need them without additional organisational restrictions or requirements. In many cases, the issue of computer access is more related to bureaucratic problems rather than their lack of physical availability within schools.

3.6.2 Lack of Time

Cuban's explanation (2001a) on the unexpected low use of ICT use in schools, despite all the effort to make schools high tech areas, is very interesting. He mentioned two important reasons for this phenomenon. Both of them are related to the time factor: namely the lack of time to find and evaluate ICT resources, and the lack of convenient times to attend computer training.

Cuban (2001a:14) cited the "slow revolution" explanation in ICT development. This theory believes that more and more teachers will become serious users of technology as the infrastructure evolves. The nature of change in technology normally occurs slowly and is transformed over time. Teachers need time to adapt to and embrace technology change. It happens in stages and often begins with the use of computers for communication and classroom preparation.

Mumtaz (2000) said that schools allocate little time to teachers to manage and familiarise themselves with ICT. The timetabling of teachers to learn ICT is impossible due to the pressure of workloads both inside and outside classrooms. Jones (2004) pointed out that lack of time for training causes problems in ICT use in schools and expecting teachers to train themselves in their own time will not solve the problem.

Research by Kington (2003) showed that for some teachers, the use of technology resulted in efficiency and time savings, while the inexperienced teachers had to spend more time to complete their tasks. Nevertheless, most teachers said using a computer saved them time in lesson preparation, record keeping and administrative tasks.

However, the teachers also complained that they needed more time to locate materials accurately and find suitable relevant websites for the range of activities in their classroom (Cuban 2001a; Kington 2003; BECTA 2004). The technical problems also resulted in time-wasting and much time was spent recovering the lost materials.

3.6.3 Lack of Training

Cuckle (2002) found that what teachers had learned in computer training courses was not always appropriate to what was available at schools. Training in general had increased teachers' knowledge in computer skills but when it came to implementation in the classrooms, the technology and software was not necessarily considered applicable with the teaching of some subjects and teachers emphasized the need to demonstrate relevance in the use of ICT both in training and later in the classroom.

The BECTA (2004) study showed that a lack of skills training is inter-related with a greater degree of anxiety in using computers. Teachers were afraid of possible technical problems because they had little knowledge and understanding of how to avoid or solve such problems. Teachers need time to overcome this fear and become familiarized with the technology. Baylor (2002) said it takes up to five to six years before they know when and how to use them.

Russell (1997) found teachers were highly critical on past professional development involving computer activities. Teachers said that the use of computer in schools required certain skills which had not been addressed in professional development training. They said adequate training was not yet available and the appointment of a computer coordinator among full-time teachers in the school had not rectified the issue of insufficient staff training.

Teachers need training and skills on how to incorporate computers in their daily teaching. It is crucial to include this strategy in ICT training in addition to ordinary training on computer literacy skills in schools. Mumtaz (2000) said even if teachers are provided with up-to-date technology, they may not be enthusiastic enough to use it in the classroom, unless they are given the evidence that ICT can make their lessons more interesting, easier, enjoyable and motivating.

3.6.4 Heavy Workload and the Pressure of Examinations

The literature shows that one of the barriers to change is related to heavy workloads in schools (Mukherjee 1983; Fullan 1992; Fink 2003). Fink (2003) showed how changes affected the lives of teachers in and outside schools. Changes had increased the intensification of work and decreased what they had previously been able to accomplish with their students. It also somehow eroded the learning opportunities for students and prevented teachers from going deeper into subject learning.

A survey on the impact of ICT in Scotland showed that one of the obstacles in implementing ICT was the heavy demands on teachers, too many priorities and too little time to complete tasks (Conlon 2003). After one year of study, Selwood (2005) found that 32% of the teachers had become more negative on the potential of ICT to reduce their workloads. Some teachers said ICT had increased their workload because some tasks took longer time to complete (PricewaterhouseCoopers 2004).

However, the survey of PricewaterhouseCoopers (2004) shows that ICT was able to reduce teachers workload particularly for those who are confident in using it. In general, ICT helped in management, storage and maintenance of work. High use of ICT was reported in preparing lessons (99%), reporting pupil progress (84%), teaching (81%), lesson planning (77%), individual or professional activity (87%), management (66%) and non-teaching contact with pupils (63%).

There was evidence from past studies indicating the impact of examinations on the use of ICT in schools. Teachers were found reluctant to use ICT when students were preparing or sitting an examination (BECTA 2004). There was heavy pressure for teachers to deliver good exam results (Mukherjee 1983; Ahmad 1998; Lee 1999; Maimunah 2007).

In Malaysia, teachers are burdened with a heavy syllabus and the pressure to deliver excellent public examination results. Even though there is not enough evidence to indicate the impact of examinations on the use of ICT in Malaysian schools, it has greatly affected some subject learning. Maimunah (2007) said that practical work and experimentation in Science subjects were often neglected by teachers because they did not contribute significantly to their pupils' overall examination marks.

3.7 Summary

This chapter explains two important issues underpinning this study; teacher and student views on change and technology change in schools. From the beginning, this study emphasized teacher and student views in understanding change in Smart Schools. The literature shows that teachers and students can provide a key and vital understanding on change in their schools. Students are almost always left out in the process of change even though they are in the majority in schools. This study aims to listen to their voices and to understand their views on change in Smart Schools.

Since technology change is the heart of Smart School initiative, this chapter investigates the achievement and contribution of ICT in schools around the globe. The literature provides both pros and cons for ICT initiatives in schools. It also discusses the barriers in implementing ICT in schools and helps towards a better understanding of technology change in Smart Schools.

Chapter 4 Research Methodology

4.1 Research Questions

This study is an attempt to understand all aspects of the change process in Malaysian Smart Schools and to understand the problems of students and teachers as they endeavour to improve learning and teaching in these schools. Following the implementation of the Smart School pilot projects in the Malaysian secondary schools, this study is aimed at suggesting an approach that can be used to incorporate the use of computer and ICT within Islamic Education by taking into consideration the views, experiences, expectations and needs of the teachers and the students.

There are four main objectives in this research. The first objective is to find out the views and attitudes of Islamic Education teachers and students towards the use of computers and ICT, and to find out the differences, if any, between these attitudes and the background of the teachers and students. The second objective is to study the barriers and obstacles in implementing the use of computers and ICT in Smart Schools from the standpoint of these teachers and students. The third objective is to investigate the needs of these teachers and students in order to incorporate the use of computers and ICT in their teaching and learning. The fourth objective is to take lessons from the views of Islamic Education teachers and students regarding the current technology change in Smart Schools.

In order to achieve these objectives, it is very important to study the new changes and their attendant problems with the eye of those who teach and learn in Smart Schools themselves. In my opinion, Smart School initiatives can be improved if we understand the problems and needs of the participants, and take their ideas and suggestions into consideration. With this in view, I have tried to design an appropriate research strategy that can be helpful in achieving this objective.

4.2 Research Methodology

This study tries to answer the research questions by using a research strategy that may offer the best insight into the research area. Even though I believe there is no single research methodology that can provide a magic answer to all these research questions, I have tried to find what I believe is the most appropriate research strategy that can be adopted. In the end, I decided to use a mixed methods strategy so that I could explore different levels of explanation about changes and problems in Smart Schools. The mixed methods strategy started with focus group interviews using the grounded theory approach to allow the emergence of data during the initial course of research.

Grounded theory approach has a proven record in discovering concepts and theories from the fields which I thought were important in a preliminary study. Grounded theory offers an opportunity to discover change from the eyes of participants in the field itself, free from the researcher's theoretical background. Robson (2002:191) said that grounded theory approach "was formulated in reaction to the sociological stance prevalent in the 1960s which insisted that studies should have a firm 'a priori' theoretical orientation. It has proved particularly attractive in novel and applied fields where pre-existing theories are often hard to come by."

This preliminary study was followed by an extensive survey of a number of Smart Schools in two states, Selangor and Negeri Sembilan. The quantitative data and qualitative data were used to provide complementary evidence and better explanations to the research questions.

4.2.1 Mixed Methods

This research combines both quantitative and qualitative data. The process of mixed methodology has been acknowledged and accepted widely in discussions on research methods nowadays. Tashakkori (1998: 19) defined mixed methodology as "products of the pragmatist paradigm that combines the qualitative and quantitative approaches within different phases of the research process".

Tashakkori (1998) explained that mixed methodology emerged after three decades of "paradigm wars" between the positivist / empiricist approach and the constructivist / phenomenological orientation. The positivist paradigm supports the superiority of quantitative methods, while the constructivist supports the so-called qualitative methods. Tashakkori (1998: 6) said the debates on qualitative and quantitative approaches started after "a revival of the fortunes of qualitative research methods in the 1960s in sociology and psychology, which had been dominated by quantitative methods (i.e. survey or experiment) throughout the 1940s and 1950s".

The root of differences between quantitave and qualitative can be traced back a long time, based on old paradigms or ancient dualism as mentioned by Chapman (2004). Pring (2004: 229) said: "They invoke different paradigms, different epistemologies. Furthermore, the former is frequently called positivistic which, more often than not, is a word of disparagement. The division between the two has become quite sharp, reflected in their respective language or in different logical configurations of otherwise familiar words objectivity/subjectivity, reality/multiple reality, truth/ consensus, knowledge/ opinion, understanding/perception and so on".

The central clash of view between the quantitative and qualitative approach is that the quantitative approach requires "precise and clear definition of term, the generation of law-like hypotheses to be empirically tested, the application of mathematical and quantifiable precision" (Pring 2004: 229). However, those who support the qualitative approach reject this idea, arguing that "one cannot add together or subtract what are essentially social or personal constructions, each intelligible within a unique and distinct life-story." (Pring 2004: 229).

After three decades of intellectual debates, such debates had become inevitable and less productive during the 1980s and 1990s. Instead, there was a strong call and numerous attempts to reconcile both paradigmatic camps (Tashakkori 1998). As a result, the pragmatism paradigm which supports the use of mixed methodology, using qualitative and quantitative methods, has emerged. A pragmatic approach allows the researcher to combine two or three different strategies in a single research study (Robson 2002). The researcher can decide to use qualitative or quantitative methods, and this decision depends much on the research questions posed in a particular research (Tashakkori 1998).

Robson (2002: 43) stated that a pragmatic approach is an approach which "uses whatever philosophical or methodological approach works best for the particular research problem at issue". This pragmatic approach linked back to the pragmatism philosophy believes that the truth is what works. Pragmatists believe that quantitative and qualitative methods are compatible and there are a lot of similarities in the fundamental values to enable a partnership, such as "belief in the value-laden of inquiry, belief in the theory-laden of facts, belief that reality is multiple and constructed, belief in the fallibility of knowledge, and belief in the under termination of theory by fact." (Tashakkori 1998: 13).

This mixed approach will more likely provide helpful insights into different and complex research questions. (Robson 2002: 6) took a clear stance that differences between the two traditions suggest that a fixed strategy either qualitative or quantitative "is more apparent than real and that can be an advantage in combining qualitative and quantitative approaches".

Burton (2000: 298) explained the benefits in combining quantitative and qualitative research: "Qualitative approaches can assist quantitative work in a number of ways such as by providing hunches or hypotheses to be tested by quantitative research; as a mechanism for validating survey data: interpreting statistical relationships and deciphering puzzling responses; to help construct scales and indices for survey items; and offering case study illustration. Survey data can identify individuals for qualitative study and representative and unrepresentative cases."

Combining quantitative and qualitative methods in this research to examine the same research question will enable the validity of the findings to be reinforced, particularly if both findings are similar. However, sometimes, the findings can produce different results because of bias in each method used. Blaikie (2000: 267) praised Mathison's argument: "She rightly points out that while different methods may produce different results because of the bias in each measure, different methods may also tap different ways of knowing. We might add, from different ways of knowing we may discover different realities."

4.2.1.1 Mixed Methods: The Sequential Model

This study has adapted the sequential model in mixed methods as cited by Tashakkori (1998: 15). The sequential model or two-phase sequential study can be started by a qualitative phase of study followed by a quantitative study, or the other way round. However, the phases of study are separated and not parallel at one time.

This research began with an exploratory phase which involved the use of focus groups as a means to gain knowledge of respondents' views, perceptions and attitudes about Smart Schools, to know their understanding of the issues being researched and to understand the meaning associated with it. The focus groups provided a rich and vast input in the participants' own terms and languages that they use to talk about the issues (Oates 2000). This study will have added benefit by including the differences of participants' responses about a particular question regarding the Smart School.

The results from the focus group were used as initial data to develop a structured questionnaire for this survey on Smart Schools. This quantitative method was carried out for descriptive purposes as "they can provide information about the distribution of a wide range of people's characteristics and of relationships between such characteristics" (Robson 2002: 234). The survey works best for obtaining a wide range of information about the needs of teachers and students.

The next phase of research involved an in-depth interviewing process to clarify and validate the previous two phases of research. Five students and six teachers were selected and investigated in this qualitative methods phase. This method helped to probe in detail ambiguity from the previous methods and to investigate individual views on certain issues.

The data collected at each phase of the research has been used to address a particular research question. By doing this, I hope the issues of any possible bias in either method and the problems of triangulation will be solved. Blaikie (2000: 271) has suggested each method "is used in the service of a particular research strategy in order to develop an understanding of the phenomenon and to assist the researcher in presenting a case for a particular answer to a research question". Data collected in each phase of research will provide evidence that can be used to address a particular research question.

4.2.2 Grounded Theory

The phrase "grounded theory" refers to theory that is grounded in the data (Strauss 1997). This theory can be obtained in the action, interactions and processes of the participants involved during the study (Robson 2002).

Strauss, one of the founders of grounded theory, stressed that grounded theory research begins without any particular theoretical commitment, and is not a specific method but more a qualitative style of analysis. Strauss (1987:5) wrote: "The methodological thrust of the grounded theory approach to qualitative data is toward the development of theory, without any particular commitment to specific kinds of data, lines of research, or theoretical interests."

Clearly, from the above statement, the ultimate objective of grounded theory is to produce and generate theory. Grounded theory is traditionally based on generating theory from the data and is opposed to the prevalent attitude where a researcher is trained only to master the grand theories and test them but is never trained to question the theories. Therefore, grounded theory came to light to encourage researchers to generate better theories in research (Glaser 1967).

Glaser (1967) also explained the importance of establishing good theory in a study where it should be possible to predict and explain behaviour which can be used in theoretical advance, to give the researcher understanding of the subject, and to guide the researcher to do a research on a particular area. Theory can also help a researcher with strategy to handle the data, and provide a researcher with modes of conceptualization for describing and explaining.

Glaser (1967) pointed out that theory generated from grounded theory can be used to facilitate qualitative research. Grounded theory is able to provide qualitative research with categories and themes that can be used in quantitative research. He said: "The theory should provide clear enough categories and hypotheses so that crucial ones can be verified in present and future research; they must be clear enough to be readily operationalized in quantitative studies when these are appropriate"

Glaser (1967:3) has identified two criteria as a quality judgement for a good theory generated from grounded theory: fit and work. He wrote: "The theory that can meet these requirements must fit the situation being researched, and work when put into use. By fit we mean that the categories must be readily (not forcibly) applicable to and indicated by the data under study; by work we mean that they must be meaningfully relevant to and be able to explain the behaviour under study".

Lomborg (2003) added two more criteria on top of the criterion of fit and work. Thus, the four criteria are fit, work, relevance and modifiable. She said that fit means the categories from the study should emerge from the data itself and not be selected from a pre-established theoretical perspective; work means the theory is able to give predictions, explanations and interpretations; relevant means the theory is relevant to the study; and modifiable means the theory can be modified in the presence of new data. She said that the most important criterion is fit since it forms the basis of theory building in grounded theory.

Clearly, the theory that is generated should possess two important elements: first, the theory should emerge from the data itself; second, the theory should not arise from any established grand theory. The theory generated should be intimate with the data, and be more relevant to the study and cannot be contested by other data. Glaser (1967:4) wrote "Theory based on data can usually not be completely refuted by more data or replaced by another theory. Since it is too intimately linked to data, it is destined to last despite its inevitable modification and reformulation."

In order to ensure the theory solidly emerges from the data, I have tried to distance myself from the literature and established theory in the beginning of the study. Glaser (1967:37) said: "At first, literally to ignore the literature of theory and fact on the area under study, in order to assure that the emergence of the categories will not be contaminated by concepts more suited to different areas".

The purpose of this strategy is to ensure the categories are relevant and best fitted to the data and that they have not come from prior theory. Therefore, the categories should be built around the data and avoid any contamination by literature at the beginning. However, Glaser (1967) allowed discussing and establishing any similarities and convergences with literature after the core category has emerged.

Any attempt to fit-in or force the categories borrowed from other theories is not allowed in grounded theory. Such attempts invite trouble in justifying the categories, make it difficult to find indicators in the data, and will not be relevant to the data. Glaser (1967:37) drew attention to the consequences of forcing the data: "The result is that our forcing of round data into square categories is buttressed by a long justificatory explanation for the tentative relationship between the two. Forcing data to apply to categories or properties is sure to arouse the disbelief of both colleagues and laymen from the start"

In grounded theory, the theory emerges from the data inductively rather than deductively. Backman (1999:148) said: "One does not begin with a hypothetical theory and then prove it. Rather, one begins by collecting the data in the field first. Then the researcher starts analysing the data and generating a theory".

Gray (2004) clearly stated that grounded theory has a clear interpretive paradigm and discarded any early theorizing. These two features make grounded theory very useful particularly for a new area of research study or where pre-existing theories are very difficult to find (Robson 2002). I believe that this feature is useful in my study as Smart Schools are new changes in our educational system where no previous studies have been done.

Grounded theory can also be applied to both qualitative and quantitative studies and puts an emphasis on analyzing data from the field. Robson (2002:191) explained further: "Grounded theory is both a strategy for doing research and a particular style of analyzing the data arising from that research. Each of these aspects has a particular set of procedures and techniques. It is not a theory in itself, except perhaps in the sense of claiming that the preferred approach to theory development is via the data you collect. While grounded theory is often presented as appropriate for studies which are exclusively qualitative, there is no reason why some quantitative data collection should not be included".

One important thing to note here is the fact that grounded theory is not confined to a specific method or a specific technique but is more a style of doing a qualitative data study. Strauss (1987:5) said: "It is not really a specific method or technique. Rather, it is a style of doing qualitative analysis that includes a number of distinct features, such as theoretical sampling, and certain methodological guidelines, such as the making of constant comparisons and the use of a coding paradigm, to ensure conceptual development and density".

I found that my study was in similar vein with grounded theory views on the necessity of understanding social change and social processes by grasping the views of social change from participants themselves. Strauss (1987) opined that the paradigms influenced and underpinned grounded theory theoretical paradigms are based on the view of changes as constant features of social life with specific direction and at the centre of the change process is social interaction and social processes.

It was important in this study to discover and understand the change and phenomenon from the participants, students and teachers alike. It was particularly important to understand the current change in Malaysian educational policies and practices from the eyes of participants, the students and teachers in Smart Schools. The way to understand change and phenomenon as suggested by grounded theory is by doing field work, by collecting the data, and by interacting with participants in the field to grasp the reality.

4.2.2.1 Grounded Theory Process of Analysis

Generating a theory in grounded theory involves a process of data analysis, working systematically in relation to the data during the course of research. Glaser (1967:6) said: "Generating a theory from data means that most hypotheses and concepts not only come from the data, but are systematically worked out in relation to the data during the course of the research. Generating a theory involves a process of research."

Charmaz (2000:510) summarized this process, saying: "Grounded theory theories studies emerge from wrestling , analyzing the data, making comparisons, developing categories, engaging in theoretical sampling and integrating an analysis."

The most important aspect, the heart of the grounded theory process, is a constant comparison analysis. Duchscher (2004) said: "This technique of contrasting data first against itself, then against evolving original data, and finally against extant theoretical and conceptual claims, facilitates the emergence of knowledge that provides us with relevant predictions, explanations, interpretations and applications"

In grounded theory, coding is also essential. It is the most important procedure of the analysis concerned with identifying, naming, categorizing and describing views, experiences, events and phenomena found in the text. There are three types of coding in grounded theory; open coding, axial coding and selective coding (Strauss 1987; Eaves 2001). In open coding, the researcher needs to be "scrutinizing the field note, interview, or other document very closely: line by line, or even word after word" (Strauss 1987). Strauss also reminds researchers to keep asking themselves questions along the open coding process: "What study are these data pertinent to and what category does this incident indicate?" Strauss (1987:30)

Axial coding is the process of relating codes and categories to each other and "the axis of one category at a time" (Strauss 1987: 32). Selective coding is the process of selecting one category to become the core category, and "the other codes become subservient to the key code under focus" (Strauss 1987). A core category is a central category of the study and can be identified when it is mentioned with high frequency and well connected to other categories.

Another important aspect of grounded theory is memoing. A memo is written by the researcher as an idea occurs throughout the process of grounded theory. The researcher pauses for a moment and writes a memo. Duchscher (2004:609) said: "Memoing is the theoretical writing-up of ideas, separate from the data that focuses on relationships between codes and their properties as they become evident to the analyst"

Last but not least, the elements in grounded theory are concerned with theoretical sampling and its role in guiding the emerging theory. Duchscher (2004: 610) has defined theoretical sampling as: "The process of ongoing data collection for the purpose of generating theory whereby the analyst jointly collects, codes, and analyses his data and decides what data to collect next and where to find them, in order to develop his theory as it emerges"

Therefore, in this study, the most important evidence is the evidence that emerges from the field itself. The fact that grounded theory allowed me to collect the data from the early stage of research and let the theory and evidence emerge from the ground itself made this approach well suited to my research.

It is important to point out that in this study I have tried to maintain the groundedness of the approach by doing initial data collection before attempting to incorporate previous research literature. Doing the initial study on the field and the preliminary data analyses from the ground also helped me in the next phase of research by providing the essential view of participants as a basis for the large survey of Smart Schools.

4.3 Research Methods and Approach

The planned strategies involved 3 phases of data collection:

4.3.1 Phase One: Focus Group and Grounded Theory Data Analysis

4.3.1.1 Focus Groups

In this study, focus groups were used as a method for qualitative data gathering. Focus groups have the potential to gather large amounts of very rich and dynamic data (Barbour 1999). The targeted participants for these focus groups were selected from Smart Schools, and gathered together to discuss a selected topic. Krueger (1994:6) mentioned that the participants in focus groups are normally selected "because they have certain characteristics in common that relate to the topic of the focus group". Krueger (1994) also mentioned that focus groups are special and specific in terms of purpose, size, composition and procedure. The participants involved in this study were chosen from Islamic Education teachers and students in Smart Schools and the size of each group was around 3 to 5 members who were relatively homogeneous in terms of their knowledge of the topics discussed.

The main aim in this study was to gain information from the focus groups about Smart Schools by concentrating as much as possible on the participants' interactions and group discussions. The discussions were planned to explore specific topics related to the research and probe the views and experiences of the students and teachers in Smart Schools without paying too much attention on reaching consensus and problem-solving. Litosseliti (2003: 9) said: "Focus groups are intended for gaining information and listening to people's view in a non-threatening environment – not to teach, inform, make a decision or resolve conflict".

Focus groups are focused in the sense that they involve some kind of collective activity around a certain number of issues (Barbour 1999; Litosseliti 2003). The main focus of activity in this study was discussing and debating educational changes and problems in Smart Schools. Focus groups are not alien in educational research and have been used extensively in the educational field (Barbour 1999; Cohen 2000; Litosseliti 2003) even though they were used originally in marketing research.

Several advantages have been stated in the use of focus groups for research such as the opportunity to "gain insight into participants' views, perceptions and attitudes on a given topic" (Litosseliti 2003:8); the opportunity to analyse the interaction between participants within the groups (Oates 2000; Litosseliti 2003); generate research hypothesis (Litosseliti 2003); and assess the needs of participants (Krueger 1994).

The focus groups were useful in this study to develop themes for the research questionnaire. They provide a rich and vast input in the participants' own terms (Oates 2000), and an opportunity to explore new information and generate ideas (Litosseliti 2003) which can help to generate concepts and hypotheses for the questionnaires. Krueger (1994) mentioned that focus groups can facilitate in preparing the quantitative method by helping the researcher to learn the vocabulary, discover the thinking pattern and provide clues to special problems in the research area. Such insight is useful for the researcher to design the questionnaire.

The literature shows that focus groups can be used in conjunction and combination with other methods (Oates 2000; Litosseliti 2003); in triangulation methods (Oates 2000; Litosseliti 2003); in preliminary studies (Krueger 1994); as an ancillary method to complement other methods (Bloor 2001); "for exploratory research where rather little is known about the phenomenon of research" (Stewart 1990:15); in the early phase of the research before using a questionnaire and in-depth interview (Bloor 2001); and as "ideal seedbeds for germinating vignettes for use in questionnaires" (Barbour 1999: 6). All these purposes can be used in conjunction with the purpose of the focus groups in this study. Liloseliti (2003) has mentioned a research using focus groups to formulate key issues among experts in distance education in USA before proceeding to the use of a questionnaire and an in-depth interview on the subject.

The original idea for the focus group and the focused interview was that people who were known to have had a certain experience could be interviewed in a relatively unstructured way about that experience (Bryman 2001). Focus groups provided the opportunity for me to analyse the views of the students and teachers regarding the Smart School project. It gave me an opportunity to understand participants' attitudes when they interacted with each other as they discussed Smart Schools.

The focus groups gave the participants the opportunity to raise issues in relation to a topic that they considered important and listen to other opinions. They had an opportunity to probe each other's reasons for holding a certain view. During these discussions, while listening to the other people, participants were able to qualify or modify their views, and express their acceptance or rejection of others' views. This could not have happened without the opportunity of hearing the views of others.

Participants may consensually agree upon the issues or may argue with each other if they do not agree and may challenge each other's views on the issues. This arguing process provided me with the chance to extract a greater contribution from participants on certain issues because they were forced to think about other opinions in order to defend or revise their own views. This process of discussion also provided me with a chance of securing more realistic views from the participants.

Therefore the interaction among participants is the key element that can give this method a high degree of validity because "what participants say can be confirmed, reinforced or contradicted within the group discussion" (Webb 2001:800). Krueger (1994:32) said: "Typically, focus groups have high face validity, which is due in large part to the believability of comments from the participants. People open up in focus groups and share insights that may not be available from individual interviews. questionnaires, or other data sources"

The focus group also provided me a good opportunity to study the ways in which participants collectively make sense of a phenomenon and construct meanings around it (Bryman 2001:338). These meanings were extremely important in developing the questionnaire for the next phase of the research. Therefore, this focus group provided much of the input to develop the themes for my questionnaire.

In this phase of the research, I held meetings with four groups of students and three groups of teachers from Smarts Schools in two states namely Selangor and Negeri Sembilan, Malaysia. Each group consisted of three to five members. Tape recording was used to record all the discussion in each group. The interviews were based on guidelines prepared in advance (see Appendix 1 for Focus Groups Interview Guidelines)

4.3.1.2 Focus Groups Data Analysis

Stroh (2000) explained that there are various approaches to analyzing interview data which depend on the aims of the research. I have applied a more grounded approach in focus group analysis compared to in-depth interview analysis. This is because I started the study free of any established or grand theory and I wanted to explore the views, interpretations and attitudes directly from the participants. In this phase, I was not in a position to test pre-conceived theories.

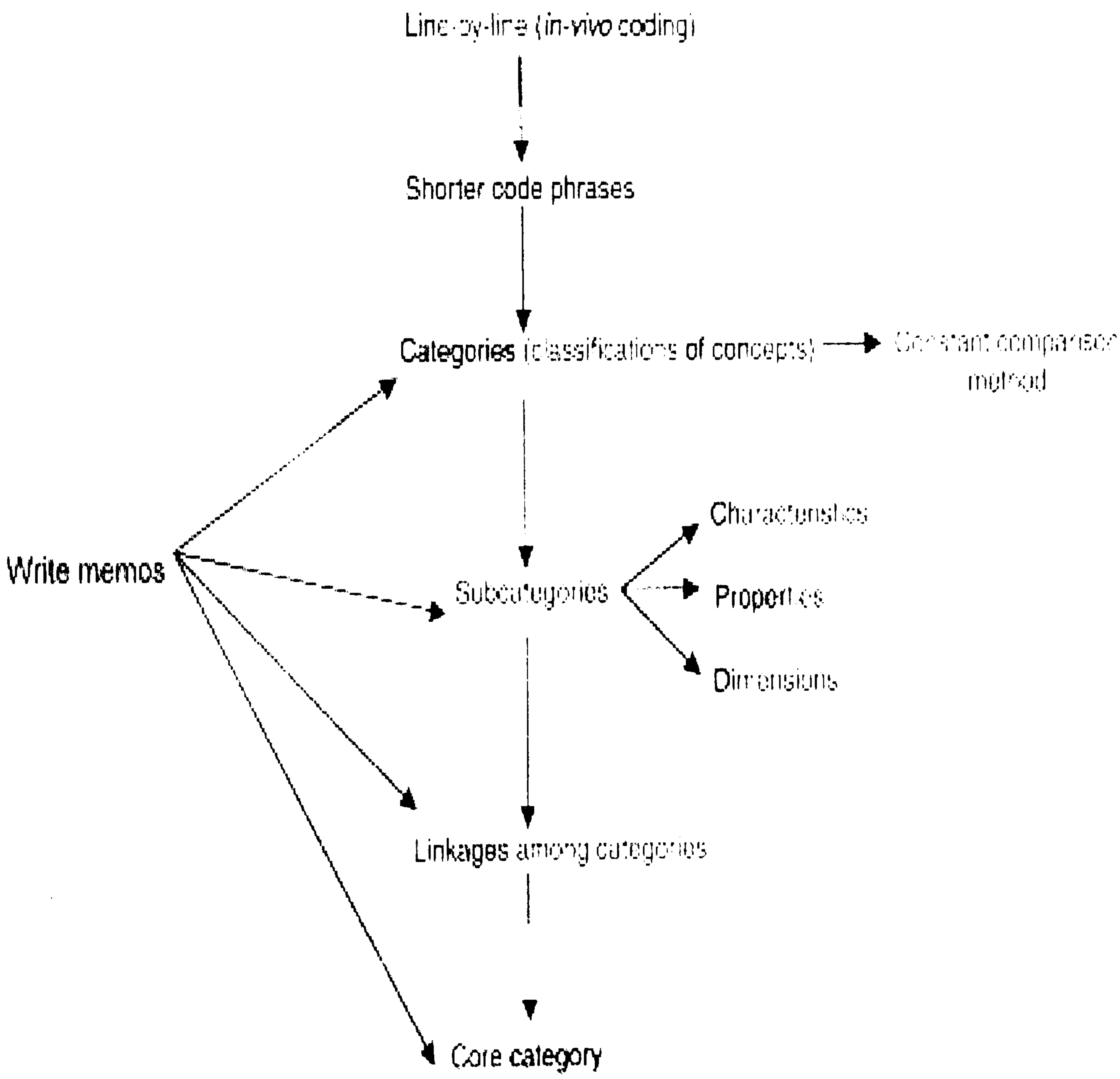
In their purest form, the research themes emerged from the data, whereas, in the last phase of interviewing which were one-on-one interviews, I wanted to explore in-depth themes, meanings and concepts which had emerged out of the focus group data and survey findings. Burton (2000) advocated a grounded approach to qualitative data analysis in which codes are allowed to emerge from the data, rather than being established before the research is conducted.

In this study, I have followed the synthesis approach for data analysis in grounded theory provided by Eaves (2001). Eaves arranged a multi-step data analysis technique to analyse the data based on the work of prominent grounded theorists like Strauss, Corbin and Charmaz. Eaves also made a diagram of the analytical steps to help researchers to determine each specific analytical step before they proceed to the next step of data analysis.

The step-by-step guide suggested by Eaves (2001) is first, open coding or line-by-line in-vivo coding; second, listing, organizing and labelling all line-by-line in-vivo coding; third, grouping all similar code phrases; fourth, grouping all similar code phrases to create clusters and meta-clusters; fifth, these label become one concept; sixth, group all similar concepts together to make category; seventh, determine the sub-category; eight, determine the linkages between categories to allow some conceptual order to emerge from the data. This can be done by constant comparison, testing hunches and using memos and literatures to understand and compare relationships.

Following the completion of the open-coding process, I followed the data analysis by the axial coding to identify the relationship between the categories. At the end of the data analysis, I chose one core category as a main category in my study. Eaves (2001) said that the core category is a problem shared by participants in the study but not clearly expressed by them. All these steps have been organized in the form of the diagram by Eaves (2001:658) as presented in Figure 4:1 below:

Figure 4:1 Diagram of Grounded Theory Synthesis Approach



Adapted from Eaves (2001:658)

In this study, following the completion of each focus group interview, I transcribed the tapes in the original Malay language. As far as possible, I transcribed the actual conversations and tried at the very best to identify the participants' voices and mark them. By identifying the speakers, I was able to attribute the voice of the speaker to a specific person and put his or her words, statements and comments in their context. I have tried to follow the suggestion from many researchers to transcribe as detailed as possible, as this might be useful to avoid missing the important elements and can be helpful in examining the data and (Krueger 1994; Litosseliti 2003)

The tapes were recorded using a digital recorder and transferred to the computer in WAV format. This file was opened using Winamp Media Player which can playback the file and jump to the point needed. This is very helpful for capturing the exact words of critical statements from every participant because frequently in these group interviews people speak at the same time. This is why Krueger (1994) advised the use of a good tape recorder in order to cope with the complexity of the transcription process. I found it was very useful to have jump-time facilities to rewind the conversation record.

The verbatim interview transcripts formed the raw data to be analyzed. The process began with open coding. I tried to gain the overall impression and capture a holistic picture of the respondents' views and experiences whilst transcribing, translating and reading of the transcript. Once I had a holistic understanding of the data, I coded the transcription by reading and reviewing the data careful, reading line-by-line and word-after-word. The main objective for this procedure was to produce concepts at the end of the process based on the data itself (Strauss 1987; Eaves 2001).

This open coding was done by using NVivo to assist qualitative data analysis. It is very helpful for the development of consistent coding schemes (Robson 2002), and presenting the structure of coding schemes (Miles 1994). Nvivo itself was influenced strongly by the style of grounded theory in doing qualitative data analysis, and so it has excelled in facilitating and supporting grounded theory data analysis (Richards 2002; Gibbs 2004)

NVivo is excellent in its exploratory approach to analysis. It was created in a way that enabled me to coordinate and arrange the ideas and data easily. It was of enormous help to me from listing and organizing all line-by-line in-vivo coding to grouping and organizing categories and sub-categories. I found that there is flexibility in coding within Nvivo in such a way I could uncode the transcript as easily as I coded them. I could even remove a code from the node list and encode the quotations which had been coded using that node as well. A node can also be renamed or moved from one tree to another or become the child node of a sibling node, or vice versa.

In doing the grounded theory data analysis, a lot of changes occur because of the development and growth of categories throughout constant comparison procedures. The ability to edit whilst coding and organizing the codes and categories easily at the same time was very beneficial in this stage of the analysis. Richards (2002) acknowledged that the advantage of an edit-while-you-code facility in NVIVO for overcoming the problem of changes in grounded theory data analysis.

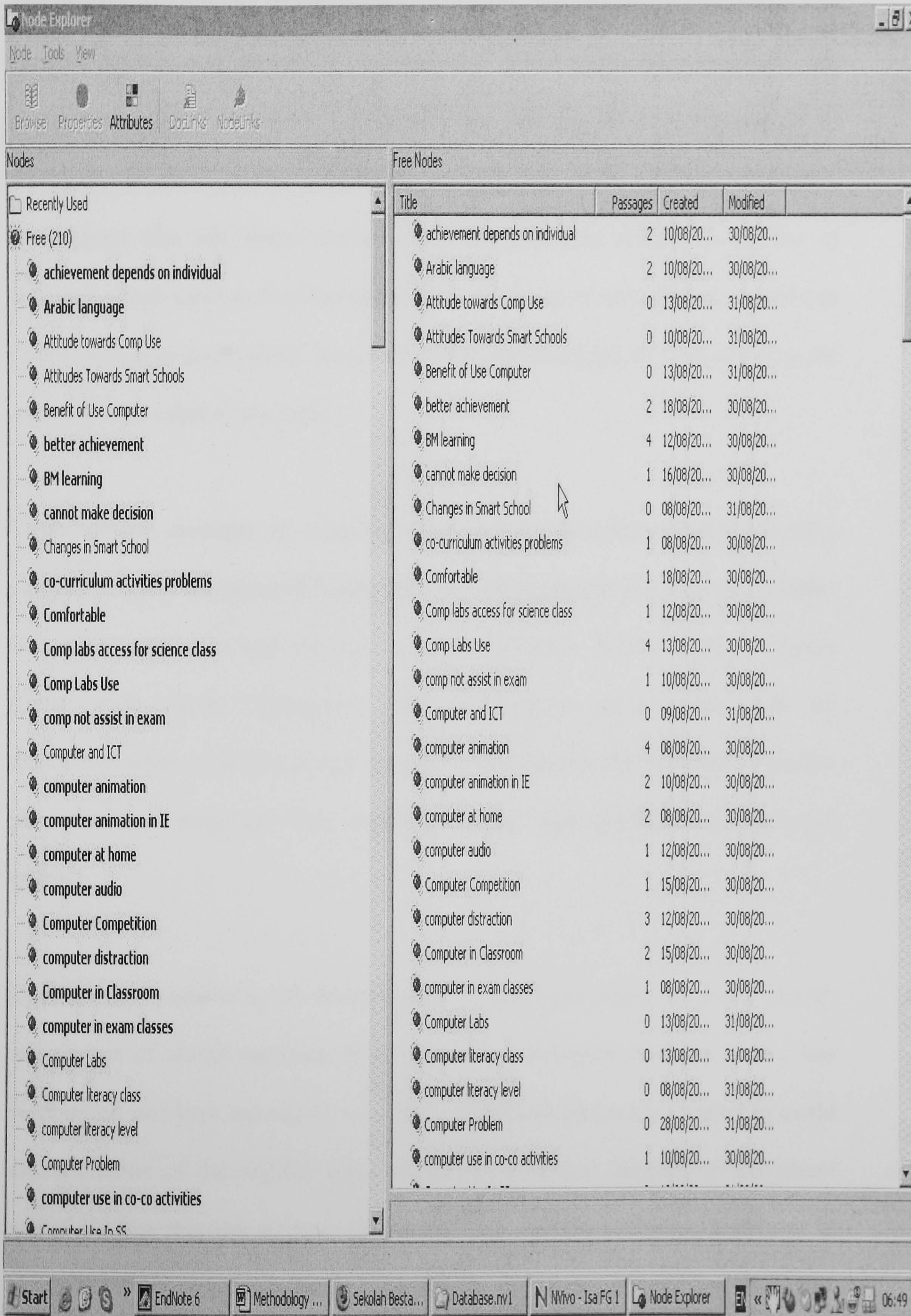
The transcript was coded in Nvivo by linking and connecting the specific text to a node. Gibbs (2004) said: "A node is not just a name or label. It is in fact a way of connecting a theoretical concept or idea with passages of text that in some way exemplify that idea". I used tree nodes as a free coding whilst coding and each of the nodes was named by the researcher to reflect the content and ideas contained within them. As suggested by Strauss (1990), I chose each code and category name that seemed most logically related to the data it represented and offered an easy reminder of its contents.

The transcript was read line by line and open-coded using free nodes. I have followed Ryan's (2005) suggestion to identify the codes and themes from the transcript by analyzing the words used by respondents. Word analysis can be done by looking for word repetition as words that are frequently repeated are often seen as being significant in the minds of respondents. For example, in this study, the words "computer" and "the use of computer" were repeated from time to time when the respondents talked about change. Word analysis can also be used to understand the local terms used by respondents and to understand the use of a word by studying its context.

An intensive analysis of words was done from time to time. Specific words in a line within the transcript to entire transcripts can be compared to each other following grounded theory's constant comparative method until no new code emerges and the codes are saturated. I used Nvivo free nodes to list all nodes discovered from the data and as a result about 200 free nodes or free codes were identified. As I coded the data, the references to the text were highlighted and stored.

When the free coding process is complete, the free codes or free nodes can be arranged accordingly using tree nodes (see Figure 4:2). The tree node structures make the data tidy, prevent duplication and repetition, can easily be categorized and can easily be modified and improved. This leads to better understanding of a respondent's views whilst making them easy to retrieve and report (Gibbs 2004).

Figure 4:2 Free Nodes



The process of grouping and arranging all similar code phrases into a cluster was done by the tree node structures. For example, in free nodes the participants talk about the use of the Internet, the use of email and the use of cyber café all of which can be classified as compatible with the use of the Internet in schools. Participants also talk about software and the problems related to the use of software which can be classified under the concept of using software. I used tree nodes to arrange and classify these free nodes and clustered all these nodes under one particular label of concepts.

These similar concepts of computer use can be grouped together to develop categories under the name of "computer use". The categories were arranged later into main categories and sub-categories using Nvivo Nodes Explorer. Eaves (2001: 658) wrote: "Categories are classifications of concepts, and are discovered when codes are compared against one another and pertain to a similar phenomenon. Categories, then, are of a higher, more abstract order than are codes"

During these procedures, all thoughts and memos were jotted down and stored. All memos of words and lines of the transcripts that gave meaning to the data were noted and kept separately in another document purposely created to avoid contamination of the original data. Nvivo has a special category of document called a memo that can separate the memo from the data. A memo document in Nvivo is another document from which the researcher can retrieve a passage, link it to the nodes, and can code and sort it in the tree and set.

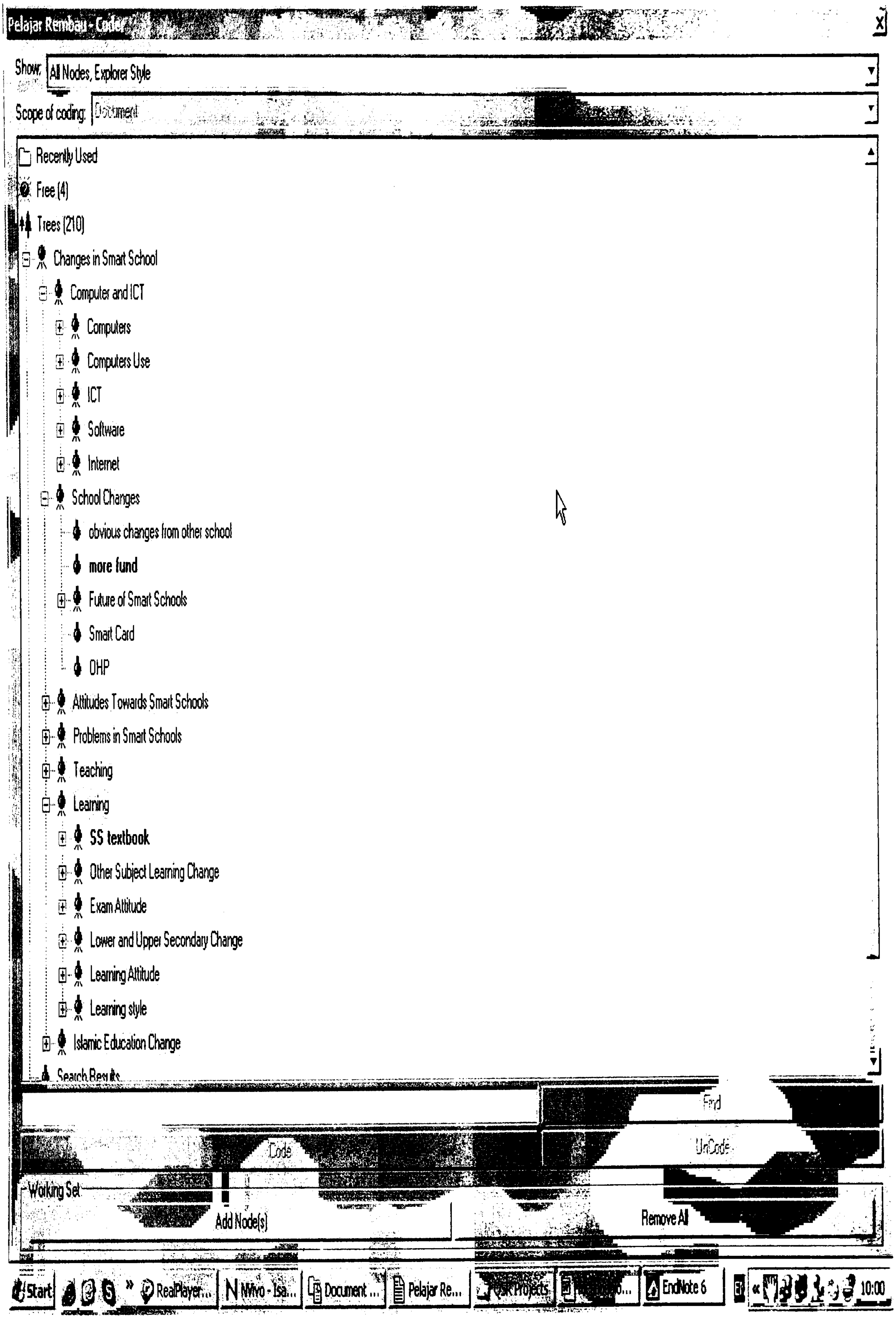
Again, I found Nvivo was very helpful because it allows the keeping of memo documents and research notes in one project file. This feature encouraged me to return and review the stored memos from time to time without any hesitation. The features in the Nvivo software allow us to treat our research notes, bibliographies, and memos as part of the project together with our field notes. As Richards (2002: 211) said: "A project need no longer be separated into the bits you do on the computer (e.g. coding the interviews) and the rest (your notes, results, reports, and conclusions). A qualitative project becomes seamless again."

Throughout the procedures of coding and categorizing, the important strategy used to find the codes and arrange the categories in this study was based on constant comparison and contrast strategy as suggested by grounded theory. This strategy was done by taking one piece of data in the form of a statement, an interview or a theme and comparing it with other statements, interviews and themes that might be similar or different in order to develop theories of the possible relations between various pieces of data. For example, comparing the data from two groups of students in two different schools (boarding school and non-boarding school) revealed a different experience of the learning process. This raises analytical questions like: "Why is this Smart School different from that?" and "How are these two Smart Schools related in some form?"

The main purpose was to compare and contrast strategies for generating knowledge about common patterns and themes within human experience. This process continues as new evidences emerge and until all the various combinations have been compared with each other. Constant comparison analysis is well suited to grounded theory because it is designed specifically to study human phenomena which, I believe, can explain much about the attitudes, behaviour and experiences of students and teachers in Smart Schools.

An early examination of the transcripts revealed seven main categories within the data, describing and illuminating the experience, views and problems of participants in facing the changes taking place in Smart Schools. The seven categories are computer and ICT experience, general school changes, participants' attitudes, problems in Smart Schools, teaching styles in Smart Schools, learning styles in Smart Schools and changes in Islamic Education in Smart Schools (see Figure 4:3). Detail of focus group data can be viewed in the Chapter 5: Findings of Focus Groups Study.

Figure 4:3 Early Categories in Free Nodes



The seven categories developed from the early study were analyzed before using axial coding strategy to find relationships and linkages to allow the axis category of phenomenon to emerge (Strauss 1990; Eaves 2001; Gibbs 2004). As a result, three main categories were identified as main causal conditions of the central phenomenon of change in Smart Schools (see Table 4:1).

These three areas of change were the use of computers, the change of learning style and the change of teaching style. Participants noticed obvious changes in their schools in these three areas particularly about new computers and the use of ICT technology such as the Internet, software and the LCD projector.

Table 4:1 Elements of Axial Coding

Model Element	Explanation	Example
Phenomenon	The central idea or event to which the set of actions is related	Coping with The Use of Computer in Smart Schools
Causal Conditions	What influences the central phenomenon, events, incidences and happenings	-Computer Use and ICT -Learning in Smart Schools -Teaching in Smart Schools
Intervening Conditions	Shaping, facilitating or constraining the strategies that take place within a specific context	-Computer Problems -Internet Problems -Software Problems -Workload Problems -Time Constraint -Exam-centred Attitude -Lack of Training -Non-Smart Subject Status
Consequences	Outcomes or results of action or interaction, resulting from the strategies	-Attitude towards Smart Schools -Attitude towards Computer Use

Adapted from (Gibbs 2004: 171)

Changes in the learning area can be seen in the new styles of learning which are more self-directed learning and self-access study. Attitudes toward learning have also changed. They are now more motivated and interested in learning. The way computers and textbooks are used also has changed. Moreover, the role of teachers, the teaching styles, and communication in classrooms have changed.

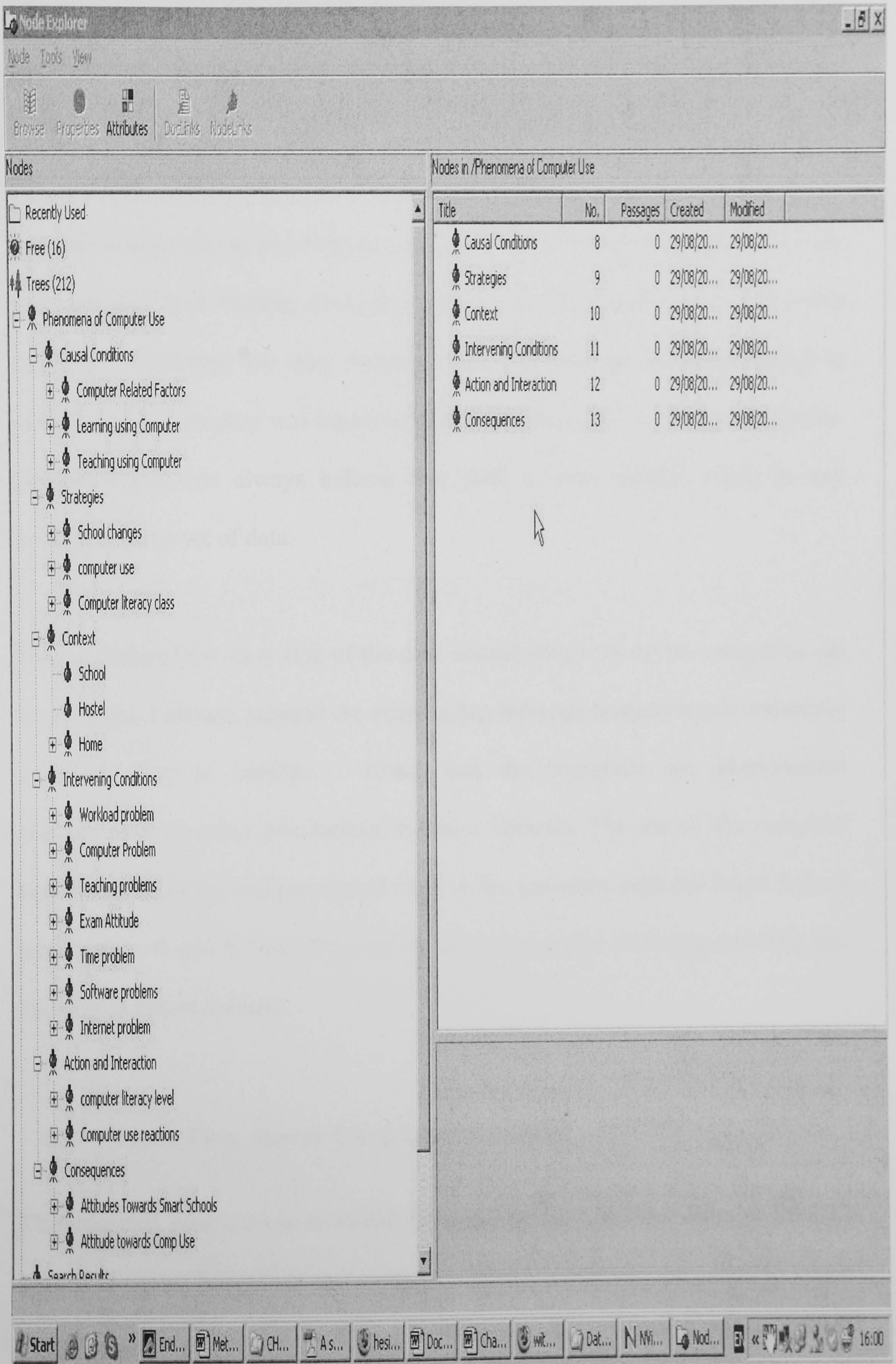
Meanwhile, the changes which have occurred in Islamic Education have been analyzed in the light of these three main causal conditions of change. The changes in Islamic Education can be seen in the same areas above. The three contexts of changes are also centred on computers and teaching and learning styles.

The constraint factors or the intervening conditions that have affected change can be analyzed from the problems raised by the participants throughout the study. Several areas of problems were identified. They are concerned with computer, internet and software related problems, workload, time constraints and exam-centred attitudes in schools, the lack of training and non-Smart subject status.

The consequences and results of changes in Smart Schools can be seen in the attitudes of participants towards these schools and their reactions and interaction in response to the changes in the three main categories of computers, the teaching processes and the learning processes in Smart Schools.

In the next stage of coding, after deep thought and reflection, I selected computer use in Smart Schools as the central phenomenon or core category in this study of change (see Figure 4:4 below).

Figure 4:4 Selective Coding



The core category is the central theme of the research, the central story line of the data, which all other categories can be draped (Strauss 1987; Strauss 1990; Eaves 2001).

In other words, selective coding is a process of choosing one category to be the core category, and relating all other categories to that category. To choose this category, I revisited the data frequently and reconfirmed the relationship to ensure that the category was based on data and related with the other categories. Grounded theorists always believe that such a core concept exists in any particular given set of data.

To comprehend the story line of the data around which all others categories can be gathered, I always pursued the relationship between categories and constantly compared one to another. I found that the computer use phenomenon encompassed all other phenomena in Smart Schools. The use of the computer was the main theme and the central topic in the interview with the Smart School participants. It can be traced across all the other topics including teaching and learning in Smart Schools.

4.3.2 Phase Two: Survey Using Questionnaire

This research uses a cross-sectional design with data collected from at least 12 groups of Smart Schools at one point in time and comparing the extent to which they differ. This design is widely used in social science research (Burton 2000) and according to Kumar (1996) cross-sectional design is best suited if the study is aimed at finding out the prevalence of a phenomenon, situation, problem, attitude or issue. Cross-sectional study is very useful to capture the overall phenomenon and situation at the time of the study, by taking a cross-section of the population of the study.

4.3.2.1 Theory Construction and Questionnaire Design

This study follows the de Vaus (2002) recommendation on the development of good explanations in order to establish a good theory in any research. This development involves two important processes: theory construction and theory testing. De Vaus explained these two stages with different starting points:

> "Theory construction is a process which begins with a set of observations (i.e description) and moves on to develop theories of these observations. It is also called grounded theory (Glaser and Strauss, 1967 and Strauss and Corbin, 1994) because it based on observation – not simply armchair speculation. Others called it post factum theory (Merton, 1968) or ex post facto theory since the theory comes after the observation rather than before. The reasoning process that is used in theory building research is called inductive reasoning and involves starting with particular observations and drawing out a theory from the observations. Theory testing differs in that it starts with a theory. Using the theory we predict how things will be in the real world. If our predictions are correct this lends support to our theory. If they are wrong there are three possible explanations: 1- The theory is wrong. 2-The prediction has been illogically derived from the theory. 3-The way we have gone about gathering information from the real world was flawed."
>
> (de Vaus 2002: 9-10)

In this study, theory construction began with previous findings from the focus group interviews. Observation and analysis of focus groups data provided the general concepts to be tested. Focus groups data as a preliminary study in the field of research helped construct the scales and indices for the survey questionnaires and provide hypotheses to be tested (Burton 2000).

Robson (2002) showed how important the preliminary study is when he suggested a pilot work in the field to obtain better information on a substantial number of variables and patterns of correlation before proceeding with the survey study. Robson (2002: 235) said: "What goes into the pot, that is, which variables you seek information on, is determined by pilot work where potential mechanisms are suggested (perhaps involving semi-structured interviews, focus groups or other methods of data collection) and by previous studies, as well as by any theoretical framework or contenders for mechanisms that you have developed."

The idea of using a mechanism or method in the preliminary study or exploratory stage before conducting a survey has long been a common and regular practice among researcher. Blaikie (2000) recommended the idea of using different types of methods sequentially, or in a series of stages and phases of research. Each stage will produce a particular kind of data, which can be used to make decisions for the next stage of data collection. He said:

> "A common example of such stages occurs in good survey research when an exploratory phase, that might include observation or even participant observation, and, perhaps, in-depth interviewing, is used to assess

respondents' level of knowledge about or awareness of the issue being investigated, the meanings associated with it, the language that they use to talk about it, and the range of possible responses that they might give if asked a particular question about it. The results of this investigation can then be used to develop, say, a structured interview schedule that approaches the phenomenon from the point of view of the researcher's construction of reality. A further phase might follow in which a few carefully selected case studies from the sample are investigated in-depth by one or more qualitative methods. This is but one way in which different methods can be used in sequence."

(Blaikie 2000: 271)

In this study, the exploratory phase has provided the concept and theory to be tested in this phase. The concepts and theory which emerged from the inductive process of the grounded theory approach are far from over and need further investigation. The concepts and theory need to be tested rigorously. Data from the survey study may validate the findings from the focus groups data and help to bridge the gaps if any.

De Veus (2002:10) explained that the theory developed in the exploratory phase should be tested constantly: "Theory building, is, in my view, the first stage of developing good explanations, and theory testing follows as an attempt to test rigorously the tentative theory we have arrived at in the theory construction phase. In practice, there is a constant interplay between constructing theories and testing them. Rarely we purely construct a theory or purely test a theory."

The questionnaire which was constructed in this research initially was based on the themes and concepts that emerged from the focus group data as mentioned above. However, I also found literature that supported the themes which emerged from the focus groups. Fullan's work (1992; 1993; 2000) about educational and school change are parallel with the finding emerged from focus groups data.

The blue print and conceptual framework of Smart School implementation by the Ministry of Education helps to understand better the themes which emerged from the focus groups. Reports from Chan (2002), the Smart Schools Assessment Group (2003) and Benchmarking of the Smart Schools Integrated Solution (2003) provides important information about the Ministry of Education's policy on ICT, the software, the teaching and learning and the teachers' training.

The questionnaires in this study had three types of question: attitudes, knowledge and attributes (see Appendix 2 The Questionnaire for Survey Study). Attitudinal questions were focused on Islamic Education teacher and student attitudes toward Smart Schools and computer use. Ten questions were posed to the students regarding their attitudes toward educational change in Smart Schools and eleven to the teachers. These questions tried to establish what the respondents thought and how they had reacted toward the concept of Smart Schools and its implementation. Reactions were measured by positive, negative and neutral attitudes.

Questions about computer use in Smart Schools were designed purposely to discover respondents' attitudes toward the computer itself and their attitude towards its use in teaching and learning process. Seventeen questions were posed to the students and nineteen to the teachers.

The knowledge questions sought to discover their knowledge on the Smart School curriculum as well as teaching and learning processes. Lastly, their technology needs were questioned. Students needed to answer eleven questions on the curriculum, thirteen on the teaching and learning processes and ten on the technology needs. Meanwhile, teachers were required to answer eight questions on the curriculum, thirteen on the teaching and learning processes and eleven on the technology, Internet and software use and needs.

Lastly, the attribute questions were designed to gather information about respondents' background and characteristics. Information on two areas was sought: first, respondent's personal background and second, his or her knowledge of computers. Student background questions were concerned about gender, schools and how long they had attended Smart Schools. Teacher background questions were concerned about gender, age, school, length of experience in teaching and their academic qualifications. Questions about a respondent's computer background concerned computer access, Internet access, computer training and computer use in school and classroom

The questionnaire used attitudinal scale questions to which respondents were asked to indicate their degree of agreement/disagreement or satisfaction/dissatisfaction with focus group data. The scale used was developed from a summated Likert scale with five fixed alternative expressions, labelled strongly disagree (SD), disagree (D), undecided (U), agree (A), and strongly agree (SA).

The questionnaire was piloted to a group of students in one school. The overall result was above 0.8 Cronbach's alpha value which means the scale was consistent and reliable (Field 2005). The result shows that the average score of items was Alpha = .896 which indicated a good value of Cronbach's alpha.

The questionnaire was then reviewed and checked by four teachers from a school and six lecturers from the National University of Malaysia. Some words and phrases were changed and edited as a result of the pilot study and comments from the teachers and the lecturers.

The questionnaire in Malay language was delivered personally to schools and I managed to administer most of the survey in the classrooms. However, there were four schools where I had not been able to administer the survey conduct because of time constraints. The administration of the survey in these schools was supervised by the Head of the Islamic Education Department. Overall, the return rate of the questionnaires was very high for the students (100%) and very good for the teachers (74%).

4.3.2.2 Theory Testing

Theories and explanations developed from the previous stage need to be tested rigorously. The idea of theory testing is to test the hypotheses derived from general theory. According to De Vaus (2002) a hypothesis is a hunch with limited statements which are based on the general theory and subsequent testing will prove that, if the general theory is true, the hypotheses must also be true.

This study adopted the six ideal and typical stages in the process of theory testing as outlined by De Vaus (2002:14); specify the theory to be tested, derive a set of conceptual propositions, restate conceptual propositions as testable propositions, collect relevant data, analyse data and assess the theory.

In this study, the theory of change was developed from the focus group data and the literature. A set of conceptual propositions was identified and a testable proposition was developed. The relationship between the variable factors showed that the participants' attitude towards change in Smart Schools was affected by the repercussions on their schools from its new status and grading and the additional new computer technology.

The focus group study showed a relationship between the attitude of participants towards Smart Schools and the status of their schools and the training they received from the authorities i.e. Ministry and schools. The focus group study also showed a relationship between attitudes towards the use of computers with the facilities available in the schools, the computer training provided in the schools, and the age of the teachers.

The hypotheses to be tested in this study are stated as below:

1- Is there any significant difference between males and females with respect to the attitudes of Islamic Education students and teachers toward Smart Schools, computer use, the curriculum, the teaching and learning, and technology needs?

HO: There is no significant different between males and females with respect to the attitudes of Islamic Education students and teachers toward Smart Schools, computer use, the curriculum, the teaching and learning, and technology needs

HA: There is a significant difference between males and females with respect to the attitudes of Islamic Education students and teachers toward Smart Schools, computer use, the curriculum, the teaching and learning, and technology needs

2- Is there any significant difference between the ages of Islamic Education teachers towards the attitudes and the use of computers in Smart Schools?

HO: There is no significant difference between the ages of Islamic Education teachers towards the attitudes and the use of computers in Smart Schools

HA: There is a significant difference between the ages of Islamic Education teachers towards the attitudes and the use of computers in Smart Schools

3- Is there any significant difference between schools with respect to the attitudes of Islamic Education students and teachers toward Smart Schools, computer use, the curriculum, the teaching and learning, and technology needs?

HO: There is no significant difference between schools with respect to the attitudes of Islamic Education students and teachers toward Smart Schools, computer use, the curriculum, the teaching and learning, and technology needs

HA: There is a significant difference between Smart Schools with respect to the attitudes of Islamic Education students and teachers toward the Smart Schools, computer use, the curriculum, the teaching and learning, and technology needs

4- Is there any significant difference between teaching experience and the attitudes of Islamic Education teachers toward Smart Schools, computer use, the curriculum, the teaching and learning, and technology needs?

HO: There is no significant difference between teaching experiences and the attitudes of Islamic Education teachers toward Smart Schools, computer use, the curriculum, the teaching and learning, and technology needs

HA: There is a significant difference between teaching experiences and the attitudes of Islamic Education teachers toward Smart Schools, computer use, the curriculum, the teaching and learning, and technology needs

5- Is there any significant difference between teachers' academic qualifications and the attitudes of Islamic Education teachers toward Smart Schools, computer use, the curriculum, the teaching and learning, and technology needs?

HO: There is no significant difference between teachers' academic qualifications and the attitudes of Islamic Education teachers toward Smart Schools, computer use, the curriculum, the teaching and learning, and technology needs

HA: There is a significant difference between teachers' academic qualifications and the attitudes of Islamic Education teachers toward Smart Schools, computer use, the curriculum, the teaching and learning, and technology needs

6- Is there any significant difference between computer training and the attitudes of Islamic Education students and teachers toward Smart Schools, computer use, the curriculum, the teaching and learning, and technology needs?

HO: There is no significant difference between computer training and the attitudes of Islamic Education students and teachers toward Smart Schools, computer use, the curriculum, the teaching and learning, and technology needs

HA: There is a significant difference between computer training and the attitudes of Islamic Education students and teachers toward Smart Schools, computer use, the curriculum, the teaching and learning, and technology needs

7- Is there any significant difference between the attitudes toward Smart Schools and the attitudes of Islamic Education students and teachers toward computer use, the curriculum, the teaching and learning, and technology needs?

HO: There is no significant difference between the attitudes toward Smart Schools and the attitudes of Islamic Education students and teachers toward computer use, the curriculum, the teaching and learning, and technology needs

HA: There is a significant difference between the attitudes toward Smart Schools and the attitudes of Islamic Education students and teachers toward computer use, the curriculum, the teaching and learning, and technology needs

4.3.2.3 Survey Data Collection

The data collection in this study was drawn from teachers and students in twelve out of sixteen Smart Schools in Selangor and Negeri Sembilan. These schools were selected because they were available for research access and within a distance that could be reached easily. This research was concentrated on secondary schools even though there were two primary Smart Schools in Selangor.

Permissions to access the schools were granted from the Economic Planning Unit (EPU) Prime Minister Office, the sponsor National University of Malaysia (UKM), the Ministry of Education, Selangor State Education Department, Negeri Sembilan State Education Department and the Smart Schools involved in this research (see Appendix 4 Applications and Permissions to do Research in Schools).

101 Islamic Education teachers were involved from the 12 schools (see Table 4.2). The questionnaires for the teachers were distributed to all Islamic Education teachers in schools involved in this study. The students were chosen randomly from Form Four students (age 16). Form Four students were chosen because they were not involved in any major examinations, were available most of the time through out the year, and had been in Smart Schools since their creation.

Table 4:2 The Number of Respondents

Schools	No. of Respondents among Teachers	Total No. of IE Teachers	No. of Respondents among Students	Total No. of Form 4 Students
AS	6	8	30	168
SP	9	7	28	139
PJ	8	8	30	165
KJ	9	18	31	152
KI	17	29	31	223
TD	6	9	32	173
BB	11	11	30	167
DR	5	7	42	119
TK	7	7	30	145
LB	10	20	31	158
TJ	7	7	29	141
SR	6	6	21	180
Total	101	137	365	1930

4.3.2.4 Analysis of Quantitave Data

The quantitative data in this research was derived from the survey findings. The data was analyzed using the Statistical Package for Social Science (SPSS). This research used frequency counts, descriptive statistics and correlative statistics to examine relationships between outcome measures. Descriptive statistics may describe something such as a characteristic of the sample, whereas inferential statistics may allow an inference about an aspect of the social world.

Descriptive methods are used to report the distributions of a sample or population across a range of variables, and to produce summary measures of the characteristics of such distributions including frequency counts and measures of central tendency to describe the average of an entire sample of scores.

Correlation coefficient studies were applied in the data analysis to discover and clarify relationships between schools, gender and the needs of teachers and students. According to Borg (1983) the advantages of the correlation method is that it provides information concerning the degree of relationship between variables, and allows the researcher to analyze how several variables may affect a particular pattern of behaviours.

The main purpose of this correlation study was to identify the relationship between two variables or two sets of data. The relationship that this study explored was to find out whether there was the possibility for two variables to vary consistently. If there is a positive relationship between two variables then this study would be interested in determining the direction of the relationship (Cohen 2000).

4.3.3 Phase Three: One-on-One Interview

This phase consisted of one-on-one interviews to seek elaboration and clarification of the problems encountered in the first two phases. Cohen (2000) suggested that the interview may be used in conjunction with other methods in a research and recommended the use of the interview to validate other methods and to follow-up an unexpected result from a previous finding. It is also very useful to study in-depth the motivations of respondents and reasons for their responses.

An in-depth interviewing process was conducted to investigate the findings from the survey. Five students and six teachers volunteered to be investigated in this qualitative method which affords an opportunity to explore an individual's opinion in depth. An in-depth interviewing process was also conducted to investigate and clarify any unexpected and contradictory results that emerged from the focus group data and survey findings.

I shared with the participants the survey findings and asked for their opinions on some interesting findings from the data. I also probed them further about the issues raised earlier in their focus groups especially regarding the barriers of computer use in Smart Schools. The interviews emphasized the importance of developing a rapport with the participants. They were reflective, self-revealing and tried as much as possible to give a feedback on a range of issues. For the details of the in-depth interviews questions and procedures please refer to Appendix 3.

I used the language of the participants to put them at ease as far as possible so that they would talk freely and openly. All interviews took place in a quiet place such as a counselling room. I tried not to influence them and let them speak as long as they wanted, listening carefully to their views with minimum interruption and interception. I put the questions as clearly as possible in a non-threatening manner to prevent them becoming confused or defensive.

Through attentive listening in a relaxed atmosphere and actively engaging with their issues and ideas, I obtained a good response from the respondents and a clear idea of their needs. I made every effort to provide an atmosphere of engagement and trust which allowed participants to develop ideas and construct meaning, and to share their views, attitudes and feelings with me.

4.4 Validity and Reliability

In this phase of the research, several attempts were carried out to minimize the threats to validity. At the design stages, an appropriate methodology was chosen for answering the research questions. This involved the use of the focus groups to develop the themes for the questionnaire and the use of the survey and the in-depth interviews to elaborate further and to clarify any problems from the focus groups.

An appropriate sample consisting of twenty-seven Islamic Education teachers and students was selected for the focus group interview. 101 teachers and 365 students participated in the survey study. As stated earlier, the sample was drawn from 12 out of 16 Smart Schools in Negeri Sembilan and Selangor which is 75% of the schools. An appropriate time scale was also planned for data collection and analysis.

This research used appropriate instruments to catch accurate, representative, relevant and comprehensive data. A pilot test involving both students and teachers resulted in a questionnaire with a good level of readability. The aim was to try to avoid any ambiguity in its instructions, terms and questions. The effort was made to avoid asking leading questions and to ensure that the level of the test was appropriate neither too easy nor too difficult. A pilot test involving both students and teachers resulted in a questionnaire with a good level of readability.

In an attempt to ensure reliability, attention was given to securing stability and consistency over time, over instruments and over the groups of respondents. Identical sets of instruments and instructions were given to all respondents to ensure reliability of this research. All respondents were given the same information with regard to the research purpose and procedures to maximize the reliability of the data.

Generally, the data collected at each phase was used to validate the findings of the previous phase and to address the specific research questions regarding the changes in Smart Schools. The findings in phase one to phase three were based on a combination of three methods: focus group, survey and interviews.

4.5 Ethical Principles in the Research

In general, the research considered four important issues in research ethics: competency, consent, confidentiality and conduct. Competency required the researcher to work within his limits and always seek advice from the supervisor before conducting the research.

It also required the researcher to seek permissions and consents from participants involved directly or indirectly in this research. Permissions were secured from the sponsor (National University of Malaysia), the Ministry of Education (MoE), and the Economic Planning Unit (EPU) (see Appendix 4 Applications and Permissions to do Research in Schools). A foreign researcher must obtain permission from the Economic Planning Unit (EPU) before they can do a research in Malaysia. In the case of this study, the EPU consulted the Ministry of Education and the sponsor before permission was granted.

Permission was also required from Selangor State Education Department and Negeri Sembilan State Education Department to enable me access to schools in Selangor and Negeri Sembilan. Consent was also secured from the head teachers, Islamic Education teachers and students involved in this study.

The participants in this study were briefed about the research objectives to ensure they fully understood and agreed. The researcher gave assurances that all data would be treated as confidential and private. Furthermore, the researcher made every effort to conduct this research as honestly as possible and to give the welfare and safety of respondents at the highest priority.

4.6 Summary

This chapter begins by presenting the methods of research used in this study. A combination of qualitative and quantitative methods was used to answer the research questions, to reinforce the findings and to interpret the responses. Focus groups were used in a preliminary study to grasp the views of participants. Grounded theory was used to analyze the focus group data and to provide categories and themes for subsequent investigation through questionnaire and interview.

This was followed by a survey study to explore further the issues raised from the focus groups. Lastly, in-depth interviews were used to validate and to follow-up on unexpected results from the previous findings. All of these methods were designed to explore the experience of Islamic Education teachers and students regarding change in Smart Schools.

Chapter 5 Findings of the Focus Group Studies

Seven focus group interviews were carried out in four schools involving ten teachers and seventeen students in two states, Selangor and Negeri Sembilan. There were four focus groups of students each consisting of four to five students and three focus groups of teachers each consisting of three to four teachers.

Two schools were selected from the state of Negeri Sembilan and another two from Selangor. These four Smart Schools were purposely selected because they represented different types of schools and would provide the requisite diversity on the background of the participants. The school types represented were: fully residential schools with selected high-achieving students, day schools, single-sex schools and religious orientation schools.

5.1 Coping with the Use of the Computer in Smart Schools

Coping with the use of the computer in Smart Schools appeared to be the core feature of the change phenomenon in Smart Schools. This emerged as a central theme and discussion about its usage was very broad and encompassed all other topics discussed in the interview. The respondents discussed how to cope with the use of the computer in teaching and learning in Smart Schools.

The use of the computer was the obvious instigator of change in the Smart Schools. From the beginning, its widespread use appeared to be the main factor that affected both students and teachers. One of the students made a comparison between Smart Schools and other schools and highlighted the use of the computer as the main factor. He said: "You can see the difference between this school and other schools. Computer use is more widespread". According to the students, this is not only limited to traditional learning activities in the classroom but also to activities outside the classroom. For instance, identification cards for library use and presentations at school assemblies.

Islamic Education teachers were also affected by the phenomenon. Some of the teachers had never used a computer before and now they felt themselves to be more computer literate. One teacher described this phenomenon. He said: "Some teachers, who themselves have never been taught using computers are now able to use the computers". Hence, in one way, the arrival of the computer in Smart Schools has provided some teachers with a unique opportunity to learn how to use the computer.

In Smart Schools, the computers are widely used, not only in teaching and learning but also for school functions and activities. One student explained: "For school functions, we use multimedia, so it looks cool". Students even use the computer in extra-curriculum activities such as designing the school's magazine, which has helped many students to enhance their computers skills. "School Magazine Khazanah is done by Form 4. 100% computer generated. No handwriting", said another student.

5.1.1 The Emergence of New Technology

This phenomenon of "widespread" computer use in Smart Schools was influenced by the emergence of new technology. The emergence of new technology in Smart Schools was clearly indicated by the obvious and sudden arrival of new computers and software, new computer labs, new cyber cafés, new LCDs and new OHPs in schools and classrooms.

The common answers from participants when asked about change in their schools were frequently related to the new computers and computer labs added to their schools. The participants spontaneously and immediately linked change with the arrival and existence of new computers in their schools. The first answer given in the interviews was related to the emergence of new computers and the obvious use of computers in Smart Schools. This indicated how significant this experience was for these students and teachers.

The increasing number of computers in Smart Schools had increased the chances for students to use them, as one student said: "Smart Schools provide more chances to use computers compared to ordinary schools". Another student praised this phenomenon and said: "This school is more complete with more ideas generated from computer use". Students felt that with the use of the computer, the change in Smart Schools was "more effective, up-to-date and sophisticated when the computer is used".

Teachers and students said that there was a significant number of "new additional computers" added in their schools after they became Smart Schools. In two schools, (AS and TK), computers can be found inside the classroom. School AS equipped every class with "four computers and a printer". Meanwhile, School TK gave its attention more to exam classes as "all Form 3 classes have computers" inside the classroom.

The establishment of computer labs had led to an obvious increase in the number of computers available in Smart Schools. There were at least 2 computer labs in each school and they were used for teaching and learning purposes by the teachers and students. According to the students, some subjects like Science, English, Malay, Economics and Mathematics are now regularly taught in the computer labs. The computer labs also allow the students to access the Internet and one student said that he always uses the computer labs in "free times" and "in between lessons".

Students were attracted to use computer labs because "it's very informative" and had "lots of pictures" that makes learning "more interesting" compared to the previous learning style, which was described as "boring and sleepy". Computer labs in Smart Schools are Internet ready and students enjoy using it. As one student said: "When we were in Form 2 and Form 3, we regularly used computer labs to explore certain websites or Tutor. We enjoyed the learning". Computer labs had another attraction for some students. They were described as "comfortable, cool with air-conditioning" that attracted students to use them.

The number of new computers also increased with the establishment of Internet cafes or cybercafe. This cybercafe had been established from the initiative of schools administration, or donated by a parents association like the one in School SR or donated by the "alumni" as in School AS. These Internet cafes have been given catchy and attractive names to catch the attention of users and to reflect their purposes. One student said: "It's more or less like a cybercafe for students use and named Cyber Didik because it's more educationally oriented".

Cybercafes also have been named "Cyber Brigade" and "Cyber Maths" which described as "full of mathematical formulae". Sometimes they are named after the sponsor, like "Perodua Lab". There have also been charges imposed on the users as other commercial cybercafes do outside the school. As one student said: "Password is been given to use cybercafe for a certain fee. It is easy, we can use it whenever we like, or at specific time allocates by school"

Students acknowledged that it was easier for them to get access to the information by having a cybercafe inside the school. One student said: "Students from the other schools have to go to the cybercafé, but here we just click to get the information. We have the Smart Schools Management System". Smart Schools have provided teachers and students with access to more resources and information compared to other schools with the help of Smart Schools' learning resources, for example TLM software (Teaching and Learning Material) and SSMS (Smart Schools Management System).

Making available TLM software and SSMS, designed and created by Telekom Smart Schools, provided another obvious change in the Smart Schools. SSMS is referred to as "intranet" which was used as an internal networking system inside the school. SSMS also has been used "for communication between teachers and students" and "for learning and management purposes" according to the students. For the teachers, they were impressed with SSMS software when "all the personal data about students and parents is available over the Internet and Smart Schools System" and "exam results will be linked to parents". According to the teachers, the class teacher was required to enter all the data regarding classroom management in SSMS.

The software provided in Smart Schools was referred as sophisticated learning tools in which "every topic is covered in the software, with the schedule and the topics. It means no need to open the textbook". The students looked at these SSMS and TLM software as new inventions that distinguish Smart Schools from other schools and at the same time offer them advantages compared to other schools.

The participants also talked about the obvious appearance of LCD projectors everywhere "even in the library". Computer labs and sciences labs have been equipped with an LCD projector. As one of participants said: "Each of 3 science labs has an LCD projector and a computer". Projectors have been used frequently for teaching purposes and for other activities as well. One teacher said: "Previously we only used tape recorders, but nowadays we can use LCD projectors. We have every facility even though they are small in number. This school has only 2 LCD projectors and a small number of computers". However, some of the teachers believe that the number is still far from enough.

Other respondents also talked about the increasing number of overhead projectors (OHP) in Smart Schools. They have been supplied by the Ministry of Education and distributed to all classes especially for those involved in major examinations such as the Lower Secondary Examination (PMR) and the Malaysian Certificate of Education (SPM). One student said: "The government supplies lots of OHP after we have become Smart Schools. Form Three and Form Five classes all have OHPs".

In conclusion, participants acknowledged that the changes in Smart Schools were very much related to the changes in computer technology. Smart Schools were created to meet the demands and challenges of the Information Age, to cater for the needs of ICT literate schools in Malaysia. The need for technology changes was acknowledged by one teacher who said: "The change towards Smart Schools is based on a general concept; technology changes, therefore education changes as well"

In these new innovative schools, participants now have ready access through ICT technology to a huge range of information on the Internet. Software focused on learning resources also has been created, organized, and managed to be responsive to school's needs and relevant to the curriculum. However, some teachers and students have not yet been satisfied. One teacher pointed out this problem: "But unfortunately the change is not in line with the clients' needs, the teachers' and the students' needs".

5.1.2 The Emergence of the New Learning Approach

The computer use factor was found inter-related with other change phenomena in Smart Schools including learning changes. Students admitted that they "never use flip chart papers anymore for presentation". Instead, they now use PowerPoint. Nor now do they ever use paper in their learning exercises because "now it is available in the computer". This new style of learning, now embedded in Smart Schools is also very much related to the use of computer. According to one student, the learning process has become "more systematic because everything is in the system" and the use of computer has made teaching and the learning process "easier for the students and the teachers". According to the students, they were asked by their teachers to search information on their own from the Internet, before, after and during lessons.

The students appreciated the graphics, pictures, videos and illustrations from the Internet which helped them to improve their understanding on particular learning topics. One student said: "We like to watch videos shown by our Bio teacher, we can watch them again after lesson and therefore learn to analyse". The use of videos and graphics in teaching, has helped to improve their "imagination" in certain topics like "the digestive system".

Students can now gain access to the Internet in many places such as in the classroom, the computer labs, the cybercafe and the science labs. This is one of the more visible changes in learning and teaching from the past and all computers in Smart Schools come fully equipped with Internet access. These computers have encouraged and boosted the use of the Internet for teaching and learning purposes. One student said: "Class learning involves lots of Internet".

Lesson materials are now prepared before the class starts. According to one student, teachers came to the classroom "prepared with materials and can teach straight away". Teachers, too, had made use of the materials available from the Internet. Teachers can download materials such as pictures and videos from the Internet. Learning materials downloaded from the Internet were frequently used by science teachers in the classroom. According to one student, one Biology teacher has downloaded videos from the Internet and then shows them to the students "almost for every class and every time". Another science teacher who teaches Physics has his own website which he "uses as a crash course for the exams".

Teaching and learning strategies used by teachers when teaching using computers has combined two elements; first, self-access learning before or at the beginning of a lesson. Students were asked by teachers "to search for information before the class" or sometimes teachers asked them to use the computer at the beginning of the lesson. Teachers closely monitor and supervise student's work and tell them clearly "what to do and where to go". This strategy has increased the ability of the student to work independently and be less dependant on teachers. It provides ample opportunities for students to develop self-directed learning and to take greater responsibility for their own learning.

The second strategy is centred on the teacher's guidance and explanations at the beginning and throughout the lesson. Teachers make "the introduction" of the topic and then ask the students to proceed with the topic in-depth by "asking us to get the information in the websites, teaching page, portals etc". After that, the teachers acquired the feedbacks from them and if there was any "obscure or confusing information" during the lesson, the teachers "will explain" and "will add more". This strategy is based on a selection of resources and instructional tasks determined by the teachers without greater responsibility on the part of the students.

Student-centred learning with lots of discussion and two-way communication between students and teachers now takes place in the classroom. Students say that the teaching and learning in Smart Schools involves "lots of discussion with teachers", "lots of interaction with teachers", "two way communication" and "lots of general communication". According to one student, it is "very unusual to observe one-way communication in class, when only the teacher speaks".

Students believe that this approach is "more attractive" and provides "better understanding" for them. Students say two-way discussion is able to "solve the problems straight away" because "you can ask whenever you don't understand". Indeed, the students asserted that there were lots of interactions with teachers when doing activities involving the Internet. They admitted that they are "not afraid to ask the teachers" and give their "feedback". Meanwhile teachers now act rightly by "not spoon-feeding" the students and by treating them like mature students.

The use of the Internet has encouraged self-access, self-paced and self-directed learning among students. One student who had had an experience studying in other schools before Smart Schools said: "In my previous school, teachers just gave lesson notes and we wrote it down. In this school, we have to do self-searching". Another student said: "Before this, my previous school was in KL. Teachers provided all the homework, and we just listened to them. But here we have to search for information on our own from the Internet, and work in groups". This approach has taught the students, as they said: "to stand on our own two feet" and "like in university and do our own research"

Teachers also supported and encouraged these approaches. One teacher said: "We encourage activities like researching in the library, finding materials and presenting them in class, in groups and as individual efforts". In the classroom, teachers use half of the time to "explain where to search" so that "the second half will be used to self-learn". Even in the absence of the teachers, students are now assigned "a job" and asked "to do research on the computers"

Despite this, the presence of teachers and their role in the classroom was still very important in the eyes of students even though computers have provided them with huge amounts of information. The teachers' presence is "a must", and one student admitted: "We cannot do without a teacher, no matter how sophisticated is the system". Teachers are also very important when it comes to organizing, enabling, and guiding the students to choose the best websites to refer to from the wide range of learning resources available on the Internet.

The role for teachers is still very important in the eyes of students because they act as the final reference if there are any problems and confusions in the process. "Too much information, too many facts and debates found on the Internet" as one student pointed-out, made them feel insecure. They thought they were safer with the presence of teachers. One student said: "If we don't understand something we still have the teacher to refer to. When the teacher explains, we're more confident".

The students' trust of their teachers is so high in such a way the students considered other resources like the Internet, learning software and SSMS (Smart Schools Management System) as secondary sources compared to the teachers. One student admitted: "The Smart system is only a secondary source. The teachers still have to teach. The Smart system is only there to help us to get more detailed information". Another student said: "The importance of the Internet is second only to teacher"

Teachers in the students' view are very flexible and very reliable resources for providing the best explanation for any confusion in learning. One of the students said: "We cannot get the answer if we ask the software. The software cannot explain to us. Even though it is possible, we still may understand wrongly with miscommunication". So, teachers are still the best avenue to refer to. As one student concluded: "At the end of the day, only teachers can resolve the matter" and another student said: "The final decision rests with the teacher"

The learning approach in Smart Schools has also encouraged students to work in groups. The students work in groups so that they can work "faster and easier". One student emphasized the advantage of group work compared to individual work when she said: "We have more ideas about something, not from only one person but a combination of different people". Working in groups allows them to share knowledge and findings. One student said: "If all of us don't know about a subject, we would cooperate to do the Internet searching, dividing the tasks into groups and then combining the findings".

Motivation to learn, being serious in learning and more responsible were among the positive characters and attitudes apparent in students in this study. The students admitted that the new approach to learning using computers had increased their motivation to learn compared to the previous approach. One of the student said: "Before, we were lacking in motivation as we learnt the same thing over again. With these changes, it's different from before". Another student added: "Prior to this it was boring and sleepy, now it's more informative, with lots of pictures, making it more interesting". The students said that they were "happier", "enthusiastic", "highly spirited" and "serious" when working with a computer in computer labs.

Another positive attitude towards learning found in this study was the good sense of responsibility among students. Some of the students said they felt more "responsible" towards learning and "nobody should bear the responsibility except yourself". One student admitted: "Failure is one's own fault. It's up to the individual. The college has provided everything". The students also believe that computers made teaching and learning process "easier" for both the students and the teachers.

The other positive developments in learning are the students' active participation in learning activities and their good interaction skills. The students were actively involved in the classroom by giving their "feedback" to the teachers in the classroom and if they are having difficulties in learning they will "ask directly to the teachers". Students also said that they were "interacting better than before", by "learning how to interact with others", and "learning how to respect others"

5.1.3 The Emergence of New Technology in Teaching Islamic Education

Teachers are challenged by their new role in Smart Schools, a role very much related to the new technology available in these schools. One teacher said: "Technology changes, therefore education changes as well". They agreed that their role has to change as a direct result of the introduction of the computer in schools. The teachers agreed that the new role is "challenging" and "different" from the previous practice.

The Islamic Education teachers are fully aware that they are required to cope with computers skills in Smart Schools. One of the teachers confidently said that they are "ready" to use computers. He claimed that all Islamic Education teachers have their own computers, they know how to use them and they know how to surf the Internet. However, one teacher refuted this claim and said that they need more "training" on how to use computers in the classroom.

The teachers agreed that the ICT technology is beneficial for their work. One teacher said: "Previously we wrote exam questions in long hand but nowadays we are using computers. It takes only one minute, because we have an information bank for exam questions. We just do the editing work". Another teacher said that the questions have been collected, copied on CD and shared with other boarding schools.

Teaching activities now involved the use of Internet and computer software. One teacher mentioned the use of PowerPoint presentations in the classroom. Another teacher said that they made use of educational software like "Al-Bayan" and "The Hajj" to teach about pilgrimage to Mecca. One teacher mentioned the positive responses from his students in the classroom by showing a copy of a real picture of "The Kaabah" or the sacred house of Allah in Mecca. The picture was downloaded from the Internet.

Teachers are well aware that the students "loved" to use computer in their learning. According to one teacher, among the activities that students enjoyed doing and completing is "the folio task" using a computer. He said the result of students' work in completing this task was "brilliant and very impressive". This has encouraged the teachers to involve more computer based activities in their classroom. One teacher said that he has incorporated ICT to "40% to 50%" of his teaching.

However, not all of the teachers have incorporated ICT in their classroom as admitted by teachers in School AS. One of the teachers said: "We are not using computers in the classroom yet, the facilities are limited, don't be surprised if the lecture technique is still widely used". Students in School KJ also admitted: "Not one of Islamic Education teachers takes us to the lab, they only teach us as usual". Another student in School SR said: "Islamic Education teachers are not using computers yet".

One teacher raised the problem of monitoring and supervision when teaching using computers in the lab: "Whenever we ask the students to go to a website, can we be sure that they are actually opening the website we ask them to open? Usually they will visit other websites. I have taken them to the computer lab before. We can't just leave them unsupervised". She said that teachers are normally not aware what happens at the back of the classroom. The teacher claimed that this problem is worse when the students are not interested in Islamic Education websites such as "Islampedia", but in other websites instead.

Teachers were doubtful that self-access learning can be a good approach for Islamic Education because of the nature of the subject. One of the teachers said: "This subject is not like science subjects. It involves the teaching of Islamic jurisprudence, verses from al-Quran and Islamic beliefs. To learn these subjects, it must be supervised by the teachers". Teachers are concerned that some topics in Islamic Education "can easily be misunderstood" if learnt only using computers. One teacher said that the nature of teaching Islamic Education is different from other subjects. Some topics in Islamic Education are abstract in nature and involve concepts that "are non-applicable and non-experimental based like in the science subjects".

One of the teachers doubted whether the self-access approach is suitable for all students in Smart Schools. He said that some students were not able to learn by themselves, and teachers need to "guide them". Therefore, he said, as far as he concerned, the conventional technique of lecturing is still "widely used" in schools to cater for this type of student.

The Ministry of Education has taken the step to make Islamic Education a Smart Subject by developing a new curriculum for it which incorporates ICT elements. According to one teacher who is the Head of Department of Islamic Education in one school, the new curriculum "has been written, retyped according to the Smart Schools concept and methodology". There are levels of learning in the syllabus starting from first to third level of learning which are similar to other Smart subjects. This new syllabus is different from the old syllabus. One teacher explained: "There must be at least 1% ICT element in the textbooks like website addresses for further information, and icons and symbols like a picture of a computer which can further expose the students to ICT".

5.2 Intervening Conditions

The reasons why some teachers were reluctant to use computers can be found in the section below:

5.2.1 Computer problems

There were many complaints about the shortage of computers. One teacher said: "The facilities, the computers and the equipments are limited". School AS was heavily affected because the school's ICT facilities were not ready. One teacher said: "We had computers in the classroom in the old school but after moving to the new building we don't have computers in the classroom, because they need to do new cabling work."

One of the schools had a problem with old, outdated and slow computers. One student explained further: "We need high speed computers. Now we only have a 350Mhz one with slow Internet connection. I wish at least for 1.6 to 3.0 GHz". According to one teacher at the school, it not been replaced for a long time. He said: "It's been already 10 years, no, 7 years, and they haven't replaced it". One teacher said: "The costs of providing computers and the maintenance cost in all Smart Schools are very high and the Government cannot afford them". Another teacher concluded: "At the end of the day, we turn back to the old technique, do the talk and chalk".

Some of participants were not convinced by the contribution of computers in teaching and learning. One teacher said: "Sometimes the use of Information Technology does not necessarily make teaching easier". One student said that computers sometimes can be a distraction for learning. He said: "Computer is distracting. It's more on enjoying and playing. It's too many entertainment programs on the Internet".

5.2.2 Internet Problems

Internet connection is one of the problems in Smart Schools. One student said that the Internet connection is "very slow at night", "a bit faster in daytime" and "sometimes jammed". It did not allow students to open more than "three windows" at one time because it will crash. In addition, sometimes the Internet connection "is down due to thunderstorms" which prevents students from accessing the Internet. Teachers were also cautious about this and one of them said: "We must have a contingency plan when the server is down or when we have no electricity".

Teachers also said that it is difficult to use the Internet as a learning tool since the information is "scattered" and "not related to the teacher's lessons". One teacher has suggested the development of "a website that can gather all accurate information". One teacher said that she had to search all the available websites and choose for her classroom unlike Maths and Science which have "many sources available on the Internet for Smart teaching". But there are also private agencies who have tried to establish learning portals and websites according to Smart School standards.

5.2.3 Software Problems

Students said that the Smart Schools software was not compatible with the national textbooks and one of them said: "Even the chapters are different". One student suggested looking into this problem and "upgrading the Smart software in accordance with the national textbook". The reason for that, according to the student, is that they have to answer the exam questions which are based on the textbook. A student said that some of the content in Malay Language software is not so important, and suggested it should not be included in the software. Another student went further and claimed: "There was wrong information in the software"

Another student suggested that Smart School software should be developed professionally. When asked on how it should look like, students said: "It should be fun", "not look like something boring", and "not slow like pre-school children's software". The conversation in the language software was criticized by the students because it was "too slow", "not motivated" and "boring".

Islamic Education teachers said that good Smart Schools' software for Islamic Education "does not exist yet". Currently, they use software developed by a private company. Islamic Education teachers said that they really needed software that was "purposely built according to the Islamic Education syllabus"

5.2.4 Workloads

In School SR, students felt that the workloads had increased compared to before because they have to "search and work on our own", unlike before when "teachers gave us all the information". One student said: "If you fail in searching for information, and are delayed, then it will be a burden on you".

In School TK, students complained about the "lots of homework". This problem became worse because the students had to participate in extra-curriculum activities after school, hence the "schedule is packed in the evening".

Students also complained that teachers were "not always available for lessons as they attended Ministerial tasks to prepare exam questions and courses of examiners". This was conceded by the teachers. One of them said: "The problem arises when the teachers have to leave the schools for Smart School training and courses".

5.2.5 Time Constraints and Time Consumption

Time constraints are one of the frequent issues stated by students and teachers. Students in school SR said that it is difficult to do self-search because of time constraints. Some of the students felt that learning using a computer is very time consuming and they had only "one hour and 10 minutes" in the classroom. If they do not have the Internet at home then they have to go to a cybercafe outside the school which is very difficult for them.

Teachers said that they have to prepare 10 minutes earlier if they want to use a computer lab for teaching. They have to go the classroom and take the student to the computer lab and sometimes the distance between the classroom and the computer lab is quite far. The fact that the computers and the Internet connection are very slow also contributes to this problem. One student said: "It takes 5 minutes to enter or log in the computers and another 5 minutes to log out".

5.2.6 Examination Attitudes

Exam-centred learning is one of the obstacles in implementing the Smart School concept of teaching and learning. Students were more concerned and interested in the outcomes of examination. One student said: "Learning using a computer is only to deepen your knowledge but it does not help you in your examinations". They would prefer to prepare for examinations, than by attending a specific computer literacy class or learning computer skills in their classroom. One of them said: "We can learn with computers at any time, but we have to prepare for the exams first". Another student said: "That's why we're not that bothered if teachers just teach during classes based on the syllabus and not using ICT".

Students also prefer to use the national textbook compared to the Smart School textbook because the national textbook is more compatible with the examination. One student commented: "Examinations were based on the school textbook whilst the Smart School textbook was just like an additional source to let students be more aware and help do their work". According to one student: "There are differences in the information content between textbooks and the

Smart system". The students were preferred the national textbook because it was the main resource and the public examination questions will be based on.

This mentality and attitude also affects the Islamic Education subject in schools. According to the teachers, Islamic Education nowadays is not a core subject like before. Now it has became an elective subject even though it still remains a compulsory subject for Muslim students. As a consequence the students are more interested in other subjects like Additional Maths, Biology, Chemistry and Physics which described are by the teachers as "commercial subjects", "important for their career", and "can guarantee them a place in a university".

The Islamic Education teachers complained that students "neglected", and "paid little attention" and "did not participated actively" in the classroom. Therefore, one teacher said they really need "creative and attractive" software that can attract the interest of the students.

5.2.7 Lack of Training

Islamic Education teachers said that they have not undergone any training on Smart Schools except for general briefing about the Smart School, the new curriculum, the new syllabus, and the new teaching and learning. One teacher said: "The training course is trying to persuade us to follow the latest developments in Smart Schools even though we have not been chosen as a Smart subject, and try to implement it manually". This training course encouraged teachers to implement Smart School concept of learning even when there was no computer availability in schools.

One teacher said that he was regularly called for Smart School training organized by the Department of Teachers Development at the Ministry of Education. He said this is not for Islamic Education but for other Smart subjects and he was invited because of his position as Head of Department. Training was regularly done for teachers who are involved in Smart subjects like Mathematics, English Language, Malay Language and Science.

5.2.8 Islamic Education is Not a Smart Subject

Teachers were concerned with the status of Islamic Education. Their attitude of "not being a Smart subject" had had an impact on their attitude towards the use of computers. They felt that there was less priority for them to use the computer labs and that priority was given to other Smart subjects. One teacher said: "The Smart subjects are given priority for use in the computer labs". Another teacher said: "Our access to computer labs is limited. We use one only when the lab is empty, which is not often".

The teachers admitted that they want Islamic Education to be one of the Smart subjects. One teacher elaborated that the real reason why Islamic Education was not chosen as one of Smart Subjects is because of "our own weaknesses". He said that Islamic Education teachers were not united and had not made any effort for it to be included as a Smart subject. Another teacher said that not many publishers and private companies are interested in helping to develop Islamic Education learning materials because it is not a Smart subject. She said: "If it becomes policy and Islamic Education is chosen as a Smart Subject, then maybe they will come forward and offer some help".

However, one teacher said that the Ministry of Education has taken steps and initiatives to approve Islamic Education as a Smart subject. He said that this is to be done in two stages. First, developing a new curriculum based on Smart learning methodology. Second, developing a computer training programme to train main instructors among Islamic Education teachers to coach other colleagues.

5.3 Summary

This chapter discusses the findings from the focus group interviews. These show that the use of computer has been a core feature of the changes in Smart Schools. Changes in teaching and learning found in this study were closely associated with the use of computers. Participants in general and the students in particular were enthusiastic about the new technology use in Smart Schools. However, the findings by no means show that Islamic Education teachers regularly used computers in their teaching even though they had shown very positive attitudes toward the use of computers.

This chapter also explains the barriers that were preventing the participants from using computers frequently in their work. In the next chapter, I aim to explore how much computers have been incorporated in teaching and learning in Smart Schools and what is the attitude of respondents toward the use of computers in Islamic Education.

Chapter 6 Findings of Survey Study

The data in this study was drawn from teachers and students in twelve from sixteen Smart Schools in Selangor and Negeri Sembilan. This research has used a cross-sectional design with data collected from these 12 schools at one point in time. This design is widely used in social science research (Burton 2000) and according to Kumar (1996) cross-sectional design is best suited if the study is aimed at finding out the prevalence of a phenomenon, situation, problem, attitude or issue. By taking a cross-section of the population of the study, the cross-sectional study is very useful in capturing the overall phenomenon and situation at the time of the study.

The results have been divided into two sections. The first section contains the result of the descriptive analysis, and the second section contains the correlation study. There were two sets of data. The first belongs to the students and the second to the teachers. For information about the initial data analysis such as the reliability test and the factor analysis test which I considered at the beginning of data analysis, please refer to Appendix 1.

6.1 Descriptive Analysis of Survey among Students

6.1.1 Students' Background

Table 6.1 below shows the number of students who took part in this study.

Table 6:1 Gender

	Frequency	Percent %
Male	159	44
Female	206	56
Total	365	100

It shows that the number of female students was slightly greater (8%) than the number of male students. We can say that the number of participants between male and female in this study is fairly balanced.

Table 6.2 below shows the number of schools which participated in this study.

Table 6:2 Schools

Schools	Frequency	Percent %
1 PJ	30	8
2 AS	30	8
3 SP	28	7
4 KI	31	9
5 TK	30	8
6 SR	21	6
7 DR	42	12
8 TD	32	9
9 KJ	31	9
10 BB	30	8
11 LB	31	9
12 TJ	29	7
Total	365	100%

The number of participants in this study varied from one school to another. This is because the participants were selected from one class in each school and the number of students in each class was different from one to another. The lowest number of students in one class was 21 and the highest number of student in one class was 42. In this study, the average class size was 30 students.

Table 6.3 below shows how many years the students spent in Smart School.

Table 6:3 Years in Smart Schools

	Frequency	Percent %
0 - 1 yrs	**186**	**51**
2 yrs	**89**	**24**
3 yrs	**16**	**5**
4 yrs	**74**	**20**

It shows that nearly half of the participants (51%) in this study had been in Smart Schools less than a year. This means they had spent their lower secondary education in other schools and had only enrolled at a Smart School after taking the Lower Secondary Examination (PMR) in the previous year. There is the probability that these students had been promoted to Smart Schools because of their excellent results in the examination. The data also shows that a quite significant number of students (24%) had spent more than 3 years in Smart Schools. This means they had been in Smart Schools since the beginning of the Smart Schools' pilot project.

6.1.2 Students' Computer Skill Background

Table 6.4 below shows the students' access to computers and the Internet at home.

Table 6:4 Access to Computer and Internet at Home

	Yes	No
Access to computers at home	294 81%	81 19%
Access to the Internet at home	218 60%	147 40%

The table shows that the majority of the students had access to computers (71%) and Internet at home (60%). Among those who had access to a computer at home, about 11% of them had no access to the Internet at home. The number of those who had access to a computer at home is considered very well in this study and almost matches other research findings in the United Kingdom.

The BECTA report in 2002 showed that 79% of young people had computer access at home. Kent (2004) reported that computer ownership among students in his study ranged from 81% to 96% depending on the socio-economic status of the students. However, the Internet access is considered low in this study compared to the findings from BECTA (2002) and Kent (2004). This is because the cost of using the Internet in Malaysia is still considered expensive for the average person.

Table 6.5 below shows the training received by the students in the beginning of Smart Schools.

Table 6:5 Training in the Beginning of Smart Schools

	Frequency	Percent %
Yes	169	46
No	196	54

The table shows that the number of students who received training at the beginning of the Smart Schools was almost as many as those who had not received training. Those who had had no training in Smart Schools was probably due to the fact that they had enrolled in Smart Schools in Form Four (Upper Secondary) and had thus spent less than a year in Smart Schools as shown in the previous data. They had lost the opportunity to join the computer literacy classes in Smart Schools which begin as early as Form One (based on Focus Groups data). The rest of the respondents (46%) confirmed that they had received computer training in Smart Schools.

Table 6.6 below shows the training on computer programmes and Internet resources received from Smart Schools.

Table 6:6 Training on Computer Programmes and Internet Resources

Resources and Programmes	Never	Personal training	Peer Group Training	Parents training	Commercial training	School training
Internet	56 15%	135 37%	59 16%	36 10%	14 4%	65 18%
School networking	114 31%	50 14%	44 12%	13 4%	5 1%	139 38%
Internet conferencing	79 22%	165 45%	70 19%	31 9%	6 2%	14 4%
E-mail	61 17%	146 40%	86 24%	43 12%	10 3%	19 5%
Word processing	93 26%	93 26%	40 11%	52 14%	18 5%	69 19%
Databases	98 27%	78 21%	32 9%	55 15%	16 4%	86 24%
Spreadsheets	165 45%	47 13%	12 3%	32 9%	13 4%	96 26%
Educational software	100 27%	61 17%	20 6%	33 9%	10 3%	141 39%
Online information	118 32%	104 29%	49 13%	29 8%	4 1%	61 17%
Others	279 76%	48 13%	21 6%	10 3%	5 1%	1 0.3%

In general, the table shows that most of the students trained themselves or received training from their schools. Not many of them received training from peer groups, parents or commercial training. Indeed quite a large number of them received no training at all.

Table 6:6 shows a quite significant number of respondents had never received any training on how to use school networking and educational software. It was a surprise that so many students had never received training in school networking and educational software considering that the backbone of Smart School implementation is founded on SSIS (Smart Schools Integrated Solution) and the use of TLM (Teaching and Learning Material).

The least training received was on spreadsheets and the most was on the use of the Internet. Many students taught themselves on Internet resources like e-mail and Internet conferencing. Most of the computer training on word processing, databases, spreadsheets and educational software was learnt in schools.

The data shows that few students received training from private computer training centres or their parents. The data also shows that commercial and parental training was relatively low among respondents across all computer applications and Internet resources listed in this study. It is quite surprising that not many of them received training from their friends and peer groups.

Table 6:7 below shows the frequency of computer use in Smart Schools.

Table 6:7 The Use of Computers in Smart Schools

	Frequency	Percent %
Never	46	13
Daily	45	12
Weekly	131	36
Monthly	90	25
Semester	25	7
Yearly	28	8

The table shows that most of the students use computers weekly or monthly. Only 12% of them can be categorized as heavy users in that they use a computer every day. Moreover, nearly the same number of respondents admitted never using computers in Smart Schools.

Table 6:8 below shows how many hours per week that the students spent on computers in the classroom.

Table 6:8 Weekly Use of Computers in the Classroom

	Frequency	Percent %
0 hr	126	35
1 hr	117	32
2 hrs	44	12
3 hrs	30	8
4 hrs	30	8
5 hrs	5	1
6 hrs	8	2
7 hrs	4	1
14 hrs	1	0.3

The table shows that the majority of the students never used computers in the classroom every week. However, quite a large number of respondents use computers at least one hour per week in the classroom. This shows that the use of computers in classroom activities is very low.

Table 6:9 below shows the use of Internet resources and computer applications in Smart Schools.

Table 6:9 The Use of Internet Resources and Computers Application in Smart School

Resources and Programmes	Never	Daily	Weekly	Monthly	Semester	Yearly
Internet	135 37%	27 7%	102 28%	63 17%	17 5%	21 6%
School networking	149 41%	15 4%	76 21%	68 19%	38 10%	19 5%
Internet conferencing	167 46%	23 6%	72 20%	68 19%	21 6%	14 4%
E-mail	152 42%	30 8%	83 23%	73 20%	17 5%	10 3%
Word processing	138 38%	15 4%	86 24%	82 23%	25 7%	19 5%
Databases	159 44%	7 2%	68 19%	80 22%	22 6%	29 8%
Spreadsheets	201 55%	4 1%	48 13%	57 16%	35 10%	20 6%
Educational software	168 46%	5 1%	59 16%	84 23%	23 6%	26 7%
Online resources	189 52%	10 3%	55 15%	81 22%	21 6%	9 3%
Others	311 85%	4 1%	7 2%	22 6%	18 5%	2 0.5%

In general, the table shows a quite surprising finding. A significant number of students admitted they never use the resources available on the Internet or the computer applications listed in this study. Nearly half of them have never used school networking, Internet conferencing, email, databases, spreadsheets, online resources and educational software.

Among those who do use computers in Smart Schools, most use is either weekly or monthly. This is confirmed in Tables 6:7 and 6:8. Most of the students use computers for word processing tasks, to check their email and to search the Internet.

6.1.3 Students' Attitudes with regard to Educational Change in Smart Schools

Section C of the questionnaire was designed to explore respondents' attitudes towards educational change in Smart Schools. 3 levels of attitude emerged from the analysis of the Focus Groups data - positive attitudes, negative attitudes and a neutral reaction towards Smart Schools. There were 11 statements for students in section C. Statements C10 to C16 reflect a positive attitude towards Smart Schools, C17 shows a neutral attitude, and statements C18-C20 reflect a negative attitude. Overall, there were more positive attitude statements in the questionnaire than negative attitudes and this matches the focus group findings.

Table 6:10 below shows the attitudes of students with regard to educational change in the Smart School initiative.

Table 6:10 Students' Attitudes Toward Educational Change in Smart Schools

Students' Attitudes on Smart Schools	SD	D	U	A	SA
10 It is something that I really need	5 1%	10 3%	18 5%	139 38%	193 53%
11 It is a chance to get some training in computer literacy	17 5%	19 5%	49 13%	164 45%	116 32%
12 I like to get involved in Smart Schools' project	2 0.5%	7 2%	55 15%	181 50%	120 33%
13 It would be useful for me	2 0.5%	12 3%	39 11%	172 47%	140 38%
14 It is very interesting for me	12 3%	5 1%	48 13%	166 46%	134 37%
15 I believe Smart Schools will be successful	8 2%	7 2%	109 30%	144 40%	97 27%
16 It is a learning change that is worth a try	14 4%	20 6%	50 14%	176 48%	105 29%
17 I just do what teachers tell me to do	42 12%	102 28%	93 26%	97 27%	31 9%
18 I am afraid of appearing incompetent in the classroom	155 43%	90 25%	51 14%	37 10%	32 9%
19 I was more comfortable before we had Smart School	102 28%	108 30%	100 27%	48 13%	7 2%
20 There is too much work in Smart School	91 25%	124 34%	75 21%	34 9%	41 11%

In general, the table shows that respondents' attitudes were very positive towards the Smart School initiative. Most of them disagreed with the negative statements about Smart Schools. This shows that the students were positive and welcomed changes in their schools.

Statements C10-C16 show overwhelming support for and interest in this innovation. A very significant number of students (over 90%) agreed that this initiative was interesting, useful and something they need. The majority of them also agreed that they would liked to be part of the change. For them this was an opportunity to acquire training in new technology. Even though quite a number of students (30%) were uncertain about the future of Smart Schools, most of them believed that this kind of innovation would be successful in the future, was worth trying, and something they wanted to be a part of it.

Statements C18 to C20 reflect negative attitudes toward Smart Schools. The table shows that most of the students disagreed with these statements. More than half of them did not agreed with the statements that they were afraid of appearing incompetent in the classroom, were more comfortable before the introduction of the Smart School initiative, and were overloaded with work now. However, 20%-27% of the students were uncertain whether they had less of a workload or a more comfortable time. This is contrary to the findings of the focus group study which found that the workload was a major problem in Smart Schools. Fear of being computer incompetent in the classroom, however, was not a big issue among students.

Statement 17 shows students are more ore less evenly split on the matter. 40% of the students agreed that they just follow teacher orders regarding the Smart School changes, whilst 36% disagreed and 26% were undecided.

6.1.4 Students' Attitudes toward Computer Technology

Section D was designed to measure respondents' attitudes toward the use of computers in teaching and learning. There were 18 statements (D21 to D38) posted to the student respondents. 10 statements (D21 to D24 and D32 to D37) represent positive attitudes toward computer use in Smart Schools, whereas the 8 statements (D25 to D31) represent negative attitudes toward the use of computers.

Table 6:11 below shows student attitudes with regard to the use of computers in Smart Schools

Table 6:11 Students' Attitudes with Regard to Computers Technology

Students' Attitudes on Computers Use	SD	D	U	A	SA
21 I enjoy doing things on a computer	1 0.3%	5 1%	27 7%	92 25%	240 66%
22 I can learn many things when I use a computer	9 3%	35 10%	59 16%	151 41%	111 30%
23 Using a computer makes me feel more creative	11 3%	37 10%	115 32%	120 33%	82 23%
24 Computers help me learn better	16 4%	45 12%	70 19%	178 49%	56 15%
25 I easily get distracted from learning by computer	55 15%	179 49%	76 21%	39 11%	16 4%
26 Learning is more difficult while using computers	106 29%	148 41%	69 19%	31 9%	11 3%
27 It is difficult to complete the syllabus while using computers	87 24%	109 30%	112 31%	36 10%	21 6%
28 I feel lack of knowledge to use computer in the classroom	83 23%	122 33%	66 18%	75 21%	19 5%
29 I feel incompetent when using computers in the classroom	82 23%	115 32%	89 24%	53 15%	26 7%
30 I believe that I can learn more from books than a computer	49 13%	83 23%	115 32%	77 21%	41 11%
31 Working with computers makes me feel isolated from my friends	102 28%	136 37%	55 15%	45 12%	27 7%
32 I need a firm mastery of computers for learning purposes	5 1%	9 3%	11 3%	171 47%	169 46%
33 If given the opportunity, I want to learn a lot about computers	1 0.3%	6 2%	11 3%	95 26%	252 69%
34 I prefer to use computers in learning	10 3%	22 6%	96 26%	109 30%	128 35%
35 I believe computers will improve my attainment	5 1%	26 7%	142 39%	129 35%	63 17%
36 If there is a computer in my classroom it would help me to be a better student	11 3%	34 9%	121 33%	89 24%	110 30%
37 I believe that computers can be used successfully in Islamic Education	10 3%	14 4%	71 20%	121 33%	149 41%
38 I think students enjoy working with computers in Islamic Education	5 1%	16 4%	90 25%	123 34%	131 36%

In general, Table 6:11 shows that there was a slight difference between the use of computers in general and the use of computer in learning. The attitude of students toward the general use of computer was positive. However, this figure decreased slightly when it came to its use for learning purposes.

Over 80% of students said they enjoy using a computer and learn many things from it. They also believe that learning how to use one and achieving mastery of its potential was essential for their work. They wanted to learn more about computers if they were given the opportunity. This reflects the importance of computer use in the views of students and there is no doubt that they were very positive in incorporating computer in their learning.

Many of them also agreed that computer helped them learn better and it is not difficult to learn using computers. The result also shows that 65% of the students preferred to use computers in their learning. About half of them were also convinced that computer availability in the classroom would make them better students and 33% of them were undecided on this matter possibly because of the lack of computers as shown in the previous study

The table shows that half of the students thought that they did not lack knowledge and competence in computers. This means that half of the students were confident that they had sufficient knowledge of and competence in computer use. The students also were more or less evenly split on whether computers made it more or less difficult to learn the whole syllabus.

An unexpected but strongly positive result was the response to statement 25. The figure shows that 70% of the students said they were not easily distracted when using a computer. This means that the vast majority of students do not see computers as a distraction or threat to their learning. This is in contrast to the findings of the focus group which suggested that this was a big issue among students.

Another important issue raised in the focus group was the use of the national textbooks. The students preferred to use a textbook rather than computers as was found in the focus group and the responses to statement 30 confirm this. Statement 30 shows a three-way more or less equal split as to whether they learn better from textbooks or not. One third of students agrees, one third disagrees and the remaining third cannot make its mind up. 32% of them were undecided and it would be very interesting to know the reasons that held them back in this matter.

The result also shows a significant number of the students (above 70%) agreed that computers can be used successfully in Islamic Education and they would enjoy the opportunity to learn this subject using computers. Based on this figure, there is no doubt that the students were very positive with regard to computer use in Islamic Education and this could pave the way to incorporate more ICT in learning Islamic Education.

6.1.5 Students' Attitudes with regard to Smart Schools' Curriculum

This section of the questionnaire was focused on the curriculum in Smart Schools. There were eleven statements in this construct of the questionnaire posted to the students. Table 6:12 below shows the students' attitudes toward the Smart School curriculum:

Table 6:12 Students' Attitudes with Regard to Smart School Curriculum

Students' Attitudes on Curriculum	**SD**	**D**	**U**	**A**	**SA**
39 It emphasis on creative thinking	5 1 %	12 3%	35 10%	198 54%	115 32%
40 It emphasis a balanced mental, emotional, spiritual and physical development	4 1%	10 3%	60 16%	176 48%	115 32%
41 It's increase my generic knowledge	2 1%	13 4%	31 9%	213 58%	106 29%
42 It teaches me how to make decisions	8 2%	16 4%	112 31%	157 43%	72 20%
43 It teaches me how to solve problems	10 3%	17 5%	106 29%	152 42%	80 22%
44 It helps me better in computer	8 2%	17 5%	45 12%	169 46%	126 35%
45 It helps me to become proficient in an international language	13 4%	26 7%	90 25%	146 40%	90 25%
46 It develops good values	10 3%	25 7%	107 29%	147 40%	76 21%
47 I believe the Smart School has produced a good curriculum	6 2%	19 5%	112 31%	143 39%	85 23%
48 I believe the Smart School has produced good textbooks	13 4%	37 10%	147 40%	95 26%	73 20%
49 I prefer Smart School textbooks rather than national textbooks	19 5%	36 10%	148 41%	87 24%	75 21%

In general, the table shows very positive attitudes toward the curriculum in Smart Schools especially on creative thinking, a balanced approach, and increasing generic and computer knowledge. However, the students were not very convinced with the ability of new Smart School textbooks to deliver the curriculum.

Specifically, we can see four of the statements (E39, E40, E41 and E44) show a very positive attitude by the respondents to the Smart Schools' curriculum. Over 80% of the students agreed with the concept of Smart School curriculum that emphasizes creative thinking, a balanced approach towards students' development, increase their generic knowledge and improves their computer skills. This data is parallel with findings of the Focus Group study which showed that students acknowledged and appreciated the role of Smart Schools in developing their students' computer skills and broadening their knowledge and information.

The data also showed that the respondents also had a positive attitude for the statements E42, E43, E45, E46 and E47, even though the percentage slightly decreased. Over 60% of the students agreed that the curriculum taught them how to make decisions and solve problems, develop good values and proficiency in international languages. They believed it to be a good curriculum.

The percentage of respondents who had positive attitude towards the curriculum dropped in two statements E48 and E49. The data shows 46% of the respondents believe that Smart Schools had produced a good textbook and 45% of them prefer to use Smart Schools' textbooks than national textbooks. About 40% of them cannot make up their mind up on this matter and their decision can change the views of students on it. However, the previous focus group study shows that the students still place their confidence in the national textbook as the main resource in their study.

6.1.6 Students' Attitudes with regard to Smart Schools' Teaching and Learning Approach

This section of the questionnaire explores the attitudes of respondents toward the teaching and learning approaches in Smart Schools. Thirteen statements were posted to the respondents. Table 6:13 below shows the students' attitudes.

Table 6:13 Students' Attitudes with Regard to Smart Schools' Teaching and Learning

Students' Attitudes on Teaching and Learning	SD	D	U	A	SA
50 I can get access to the relevant learning materials	10 3%	27 7%	58 16%	164 45%	106 29%
51 I can easily access topics of interest to me	8 2%	19 5%	46 13%	185 51%	107 29%
52 I can learn at my own pace	13 4%	23 6%	60 16%	189 52%	80 22%
53 There are enough learning materials to help the students	13 4%	28 8%	75 21%	163 45%	86 24%
54 There are more two-way communications	13 4%	12 3%	80 22%	168 46%	92 25%
55 I enjoy learning in a Smart School	4 1%	17 5%	82 23%	175 48%	87 24%
56 Classroom activities are more interesting	6 2%	23 6%	91 25%	175 48%	70 19%
57 I feel more confident in exams now	8 2%	34 9%	128 35%	137 38%	58 16%
58 I have attained better exam result in Smart School	17 5%	52 14%	117 32%	107 29%	72 20%
59 I have made significant progress in learning	17 5%	55 15%	141 39%	103 28%	49 13%
60 I can interact better with others	5 1%	21 6%	77 21%	202 55%	60 16%
61 I can work collaboratively in groups	6 2%	13 4%	74 20%	215 59%	57 16%
62 I am more motivated towards learning	8 2%	10 3%	62 17%	205 56%	80 22%

In general, the responses show that the students had a good attitude toward teaching and learning in Smart Schools (statements F50 to F56, and F60 to F62).

However, fewer students were convinced they had made a significant progress in learning and examinations (statements F57 to F59).

Specifically, the table shows a very high percentage of the students agreed they were able to get access to topics of interest to them in their learning. Over 70% of them also had a positive attitude towards learning strategies in Smart Schools, and had been able to get access to relevant learning materials and learn at their own pace. These findings are parallel with the objectives and strategies of learning emphasized by the Ministry of Education in the Smart Schools' blueprint document.

In terms of classroom atmosphere and learning achievement in Smart Schools, the table shows positive responses on communications in the classrooms, learning satisfaction, classroom activities, interaction skills, group work and learning motivation. Most of the students were agreed on the improvement of communication and learning activities in the classrooms.

However, this positive trend of responses was not maintained for statement 57 and 58. The results show the percentage of students agreeing with these statements fell. Less than 50% of the students agreed that they had made a significant progress in learning and attained better exam result in Smart Schools. Perhaps the fact that this initiative is relatively new made it hard to assess and difficult to say whether the current achievement was related directly to this initiative.

6.1.7 Students' Needs with regard to the Use of Technology, Internet and Software

This section (G) investigates the needs of respondents in ICT technology. There were ten statements posted to the respondents to investigate the technology needs in learning (G63, G64 and G68); the need to spend more time with technology (G66 and G67); the need for software (G70 and G71); and the need for technical support either from technicians or colleagues (G65 and G72). The table 6:14 below shows the result of their needs in ICT technology:

Table 6:14 Students' Needs with Regard to The Use of Technology, Internet and Software

Students' Attitudes on Technology, Internet and Software	SD	D	U	A	SA
63 I would like more subjects that integrate technology	3 1%	24 7%	37 10%	141 39%	160 44%
64 I would like more IT resources to help me learn	5 1%	7 2%	58 16%	155 43%	140 38%
65 I would like to work with other students to become more proficient using technology	3 1%	10 3%	43 12%	194 53%	115 32%
66 I would like more time to learn how to use computers	8 2%	49 13%	81 22%	126 35%	101 28%
67 I would like more time to access the Internet	7 2%	60 16%	44 12%	137 38%	117 32%
68 I would like to explore technology in the classroom	3 1%	8 2%	66 18%	151 41%	137 38%
69 I would like more time to use computers in learning	16 4%	52 14%	84 23%	120 33%	93 26%
70 I would like more software that is curricular-based	7 2%	16 4%	83 23%	159 44%	100 27%
71 I would like more software that is examination-based	5 1%	24 7%	87 24%	162 44%	87 24%
72 I would like more technical support	1 0.3%	22 6%	97 27%	158 43%	87 24%

Overall, the above table shows that the majority of students admitted the need to incorporate ICT, the need for more time to be spent on ICT, the need for software and the technical support.

Over 80% of them agreed that they need more subjects integrated with technology and more IT resources to help them in their learning. They also agreed upon the importance of exploring the technology in the classroom. This means that the students acknowledged the great need to increase the potential use of ICT in the classrooms, and in learning activities and subjects. As a consequence of that, many of them agreed that they like to work collaboratively with their friends to become more proficient using technology.

The table also shows the need for more time to be spent on ICT and computer use. They agreed that they need more time to learn how to use computers and more time to access the Internet. However, there is a significant number of students who either disagreed or are undecided about spending more time using computers in their learning. There could be a question mark on their willingness to use computers in their learning and perhaps it could be related to the issue of time constraints addressed by them in the previous study.

The table also shows the need for software use and technical support. The students emphasized the need for curricular-based and examination-based learning opportunities in Smart Schools. They also need technical support in school to help them work with the technology. This shows that the students need a specific type of software that can help them in learning and appropriate technical support is very important to ensure this technology works. This finding is consistent with the previous finding which exposed the need of software that supports the national syllabus.

6.2 T-Test, One-Way ANOVA and Correlation Analysis of Survey Study among Students

Independent t-tests were carried-out to investigate the differences by comparing two means of two different variables. The T-test was used to look for the effect of gender and training on Islamic Education teachers' and students' attitudes. Meanwhile, one-way ANOVA tests were used to test the differences between three or more groups by comparing means of several independent variables' attitudes. ANOVA tests were used to look for the multi-school effect on students' attitudes and the effect of age, teaching experience, academic qualifications and the multi-school effect on Islamic Education teachers' attitudes.

Lastly, the Pearson correlation was used to investigate the relationship between the attitudes of Islamic Education teachers and students towards the Smart School initiative, the use of computers, the curriculum, teaching and learning, and technology needs. This study applied the general guidelines for interpreting correlation co-efficients by Cohen (2000) in describing the relationship between attitudes of Islamic Education teachers and students. Cohen said that a correlation between 0.20-0.35 is considered as indicating a very slight relationship that may have limited meaning in exploratory research, a correlation between 0.35-0.65 is statistically significant and the group prediction may be possible, and a correlation between 0.65-0.85 is very accurate to make the group prediction. A correlation over 0.85 indicates a close relationship between the two groups of variables.

6.2.1 The T-test to investigate the Differences between Genders toward the Attitudes of Islamic Education Students

Table 6:15 below shows the result of the T-test to investigate the differences between males and females and their attitudes toward the Smart School initiative, the use of computers, the curriculum, the teaching and learning process and their needs.

Table 6:15 T-test to investigate the Differences between Gender and Attitudes

Independent Samples Test

		Levene's Test for quality of Variance		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	ig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
C Attitude towarc Smart Schools	Equal varian assumed	2.149	.144	2.456	363	.015	.13071	.05322	.02604	.23538
	Equal varian not assumed			2.413	314.452	.016	.13071	.05417	.02413	.23729
D Attitude towarc Computer Use	Equal varian assumed	.200	.655	2.031	363	.043	.11253	.05540	.00358	.22148
	Equal varian not assumed			2.024	335.414	.044	.11253	.05559	.00318	.22188
E Attitude toward Curriculum	Equal varian assumed	.393	.531	-.458	363	.647	-.02430	.05306	-.12865	.08005
	Equal varian not assumed			-.452	321.930	.651	-.02430	.05375	-.13004	.08143
F Attitude toward Teaching and Lea	Equal varian assumed	.728	.394	1.608	363	.109	.09015	.05605	-.02008	.20038
	Equal varian not assumed			1.566	299.803	.118	.09015	.05756	-.02313	.20343
G Technology Ne	Equal varian assumed	5.783	.017	1.017	363	.310	.05984	.05882	-.05583	.17551
	Equal varian not assumed			1.044	362.003	.297	.05984	.05729	-.05283	.17250

The result shows that there were significant effects ($P<0.05$) of gender on the students' attitudes on the Smart School initiative ($n=365$, $t=2.456$, $P=0.016$) and the use of computers in Smart Schools ($n=365$, $t=2.031$, $P=0.044$). This means we can infer that both male and female students in this study were different in terms of their attitude toward the Smart School initiative and the use of computers in Smart Schools. The overall means indicate that the male students had a better attitude towards the Smart School initiative (M=3.936, SD=.542) and the use of computer (m=3.867, SD=.532). Please refer to Appendix 6.

However, the result shows no significant effects ($P>0.05$) of gender on the students' attitudes on the curriculum ($n=365$, $t=-0.458$, $P=0.674$), the teaching and learning in Smart Schools ($n=365$, $t=1.608$, $P=0.109$) and the technology needs ($n=365$, $t=1.044$, $P=0.297$). We can infer from this that both male and female students in this study held the same attitude toward the curriculum, the teaching and learning in Smart Schools and technology needs

6.2.2 The T-test to investigate the Differences between Trained Students and Untrained Students and their Attitudes towards Smart Schools

Table 6:16 below shows the result of the T-test to investigate the differences between trained and untrained students and their attitudes toward the Smart School initiative, the use of computer, the curriculum, the teaching and learning process and their needs.

Table 6:16 T-test to investigate the Differences between Computer Training and Attitudes

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
C Attitude towards Smart Schools	Equal variances assumed	.167	.683	5.072	363	.000	.26158	.05157	.16017	.36299
	Equal variances not assumed			5.058	350.810	.000	.26158	.05171	.15987	.36328
D Attitude towards Computer Use	Equal variances assumed	1.187	.277	4.484	363	.000	.24179	.05393	.13574	.34785
	Equal variances not assumed			4.518	362.308	.000	.24179	.05351	.13656	.34703
E Attitude towards Curriculum	Equal variances assumed	.001	.977	2.293	363	.022	.12015	.05240	.01710	.22321
	Equal variances not assumed			2.298	357.854	.022	.12015	.05229	.01731	.22299
F Attitude towards Teaching and Le...	Equal variances assumed	.430	.512	3.647	363	.000	.20036	.05494	.09231	.30840
	Equal variances not assumed			3.622	343.421	.000	.20036	.05531	.09156	.30915
G Technology N...	Equal variances assumed	.013	.911	-1.096	363	.274	-.06408	.05848	-.17908	.05092
	Equal variances not assumed			-1.091	347.846	.276	-.06408	.05874	-.17961	.05145

The result shows that there were significant differences ($P<0.05$) between those who had had training in the beginning of Smart Schools and those who had not regarding their attitudes toward the Smart School initiative ($n=365$, $t=5.072$, $P=0.000$), computer use ($n=365$, $t=4.484$, $P=0.000$), the curriculum ($n=365$, $t=2.293$, $P=0.022$), and the teaching and learning in Smart Schools ($n=365$, $t=3.647$, $P=0.000$).

This means we can infer that trained students and untrained students were different in terms of their attitudes toward the Smart School initiative, the use of computers in Smart Schools and the teaching and learning process in them. The overall means also indicate that the trained students had a better attitude towards the Smart School initiative (M=4.003, SD=.501), the use of computers (M=3.934, SD=.484), the curriculum (M=3.801, SD=.491) and the teaching and learning process in Smart Schools (M=3.867, SD=.548). Please refer to Appendix 6.

The result also shows that there was no significant difference ($P>0.005$) between those who had had training in the beginning of Smart Schools and those who had not regarding their attitudes toward the needs in technology ($n=365$, $t=-1.096$, $P=0.274$). We can infer from this that in terms of their needs in technology both trained students and untrained students had the same needs.

6.2.3 The ANOVA test to investigate the Differences between Schools and their Students' Attitudes toward Smart Schools

Table 6:17 below shows the result of the ANOVA test to investigate the differences between schools and their attitudes toward the Smart School initiative, the use of computers, the curriculum, the teaching and learning process and their needs.

Table 6:17 OneWay ANOVA Test to Test the Differences of Attitudes between Smart Schools

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
C Attitude towards Smart Schools	Between Groups	4.973	11	.452	1.796	.053
	Within Groups	88.839	353	.252		
	Total	93.812	364			
D Attitude towards Computer Use	Between Groups	7.324	11	.666	2.506	.005
	Within Groups	93.791	353	.266		
	Total	101.114	364			
E Attitude towards Curriculum	Between Groups	4.516	11	.411	1.661	.081
	Within Groups	87.259	353	.247		
	Total	91.775	364			
F Attitude towards Teaching and Learning	Between Groups	4.522	11	.411	1.472	.140
	Within Groups	98.559	353	.279		
	Total	103.081	364			
G Technology Needs	Between Groups	3.292	11	.299	.963	.480
	Within Groups	109.731	353	.311		
	Total	113.024	364			

The results show that only one construct had a significant value ($P<0.005$). There was a significant difference between the schools involved in this study in terms of their attitude towards the use of computers ($n=365$, $F=2.506$, $P=0.005$). We can infer from this that there was a significant difference at least in one school from eleven schools in this study in terms of their students' attitudes toward the use of computers.

The overall means show that School TJ had a better attitude towards the use of computers compared to the rest of the schools ($M=4.097$, $SD=.481$). Meanwhile, School PJ had the lowest score of means in terms of its attitudes towards the use of computers ($M=3.583$, $SD=.426$). Please refer to Appendix 6. This is a surprising result because School PJ is categorized as a Level A Smart School which enjoyed the higher level of technology and benefited from the full classroom model in technology.

However, the data clearly indicate that no statistical significances could be found between the schools involved in this study in terms of their attitudes toward the Smart School initiative (n=365, F=1.796, P=0.053), the curriculum (n=365, F=1.661, P=0.081), the teaching and learning (n=365, F=1.472, P=0.140) and technology needs (n=365, F=0.963, P=0.480).

6.2.4 The Pearson Correlation Test to investigate the Relationship between Attitudes of the Students

Table 6:18 below shows the Pearson correlation test to investigate the relationship between attitudes of the students.

Table 6:18 Pearson Correlation Test to Investigate the Relationship between Attitudes

Correlations

		C Attitude towards Smart Schools	D Attitude towards Computer Use	E Attitude towards Curriculum	F Attitude towards Teaching and Learning	G Technology Needs
C Attitude towards Smart Schools	Pearson Correlat	1	.485**	.578**	.567**	.234**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	365	365	365	365	365
D Attitude towards Computer Use	Pearson Correlat	.485**	1	.376**	.427**	.358**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	365	365	365	365	365
E Attitude towards Curriculum	Pearson Correlat	.578**	.376**	1	.633**	.257**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	365	365	365	365	365
F Attitude towards Teaching and Learr	Pearson Correlat	.567**	.427**	.633**	1	.185**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	365	365	365	365	365
G Technology Nee	Pearson Correlat	.234**	.358**	.257**	.185**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	365	365	365	365	365

**. Correlation is significant at the 0.01 level (2-tailed).

Overall, the results show that there was a significant positive linear correlation between the variables ($P<0.001$) with various degrees of relationship. The strongest correlation was between the students' attitude toward the curriculum and the teaching and learning in Smart Schools ($r=.633$, $P<0.001$). This shows that those who had better attitudes toward curriculum in the Smart Schools tended to have a better attitude toward the teaching and learning in Smart Schools. Maybe the reason is they really appreciated the impact of the new curriculum and the new teaching and learning strategies in Smart Schools as found in the Focus Group study findings.

The results also show that there were statistically significant correlations between the Smart School initiative and the curriculum ($r=.578$, $P<0.001$) and between the Smart School initiative and the teaching and learning ($r=.567$, $P<0.001$). This result indicates that those who had better attitudes towards the Smart School initiative tended to have a better attitude toward the Smart Schools` curriculum and the teaching and learning in Smart Schools.

The result also shows that there were statistically significant correlations between the use of computers and other variables. The correlation between the use of computers and the Smart School initiatives was ($r=.485$, $P<0.001$); between the use of computer and the curriculum ($r=.376$, $P<0.001$); between the use of computer and the teaching and learning ($r=.427$, $P<0.001$); and between the use of computer and the technology needs ($r=.358$, $P<0.001$).

The weakest correlation in this study was regarding technology needs. The need for technology was very weak in the correlation with the Smart School initiative ($r=.234$, $P<0.001$); with the use of computers ($r=.358$, $P<0.001$); with the curriculum ($r=.257$, $P<0.001$); with teaching and learning in Smart Schools ($r=.185$, $P<0.001$). This result shows a very weak relationship between the technology needs and the Smart School initiative, the curriculum, the teaching and learning and the technology needs in Smart Schools.

6.3 Descriptive Analysis of Survey among Teachers

6.3.1 Teachers' Background

Table 6.19 below shows the number of teachers who took part in this study.

Table 6:19 Gender

	Frequency	Percent %
Male	30	30
Female	71	70

The data shows that 70% of the respondents were female teachers and 30% were male teachers. This figure reflects the present ratio of teachers in Malaysian schools in which the number of male teachers has decreased every year. Only 36% of teachers in secondary schools are male.(MMoE 2004).

Table 6.20 below shows the percentage breakdown of teachers by age-group in this study.

Table 6:20 Age

Schools	Frequency	Percent %
21-25 yrs	8	8
26-30 yrs	17	17
31-35 yrs	26	26
36-40 yrs	30	30
41-45 yrs	9	9
46 yrs and above	11	11

The table shows that slightly over half of the respondents were teachers aged 31 to 40 years. Very few were under 25 years of age. This is probably because the respondents were selected from secondary schools which normally employ graduate teachers with first degrees from local universities and who normally graduate at the age of 24. The table also shows that the percentage of teachers above 46 years old was also small.

Table 6.21 below shows the percentage breakdown of teachers by schools.

Table 6:21 Schools

Schools	Frequency	Percent %
1 PJ	8	8
2 AS	6	6
3 SP	9	9
4 KI	17	17
5 TK	7	7
6 SR	6	6
7 DR	5	5
8 TD	6	6
9 KJ	9	9
10 BB	11	11
11 LB	10	10
12 TJ	7	7

The table above shows that the number of Islamic Education teachers involved in this study varied from one school to another. This is because the number of Islamic Education teachers in each school depends on the number of Muslim students in a particular school. The more Muslim students there are in a school, the greater the number of Islamic Education teachers there will be in that school. The table illustrates that the largest number of Islamic Education teachers in one particular school was 17, while the smallest number in one school amounted to 5% of the whole sample's population.

Table 6.22 below shows the percentage breakdown of teachers by their years of teaching experiences.

Table 6:22 Teaching Experiences

	Frequency	Percent %
0 -1 yrs	13	13
2-5 yrs	16	16
6-10 yrs	27	27
11-15 yrs	30	30
15 yrs and above	15	15

Table 6:22 shows that only a small number of respondents in this study had less than one year's experience. The majority of the teachers (81%) had teaching experience of more than 6 years. Teaching experience is very important for teaching in the boarding schools in Malaysia and most of the Smart Schools involved in this research are full-time boarding schools.

Table 6.23 below shows the percentage breakdown of teachers by their length of teaching experience.

Table 6:23 Academic Qualifications

	Frequency	Percent %
Teaching Certificate	5	5
Diploma in Education	7	7
Bachelors Degree	80	80
Master Degree	9	9

Table 6:23 shows that most of the teachers were first degree holders. Only a small percentage of them had not graduated from universities. These teachers

held teaching certificates from Malaysian Teaching Colleges. The table also shows a small percentage of teachers had Masters degrees.

6.3.2 Teachers' Computer Background

Table 6:24 shows the percentage of teachers with computers and the Internet access at home.

Table 6:24 Access to Computers and Internet at Home

	Yes	No
Access to computers at home	84 84%	17 17%
Access to the Internet at home	51 51%	51 51%

The table shows that the majority of the teachers had access to computers at home and slightly over half of them had access to the Internet at home. This data also shows a slightly different result between teachers and students. The teachers had greater access to a computer perhaps because of the nature of their work which requires them to use computers. But they had less access to the Internet at home possibly because they cannot afford the subscription costs which are quite expensive in Malaysia.

Table 6:25 below shows the percentage of teachers who had training in the beginning of Smart Schools

Table 6:25 Training at the Beginning of Smart Schools

	Frequency	Percent %
Yes	64	64
No	37	37

Table 6:25 shows that majority of the teachers said they had received training at the beginning of Smart Schools. In the early stage of Smart School implementation, the Ministry of Education organized in-school training and staff development to explain the concept of Smart Schools to the teachers. However, 37% of the respondents said that they had not received any training and this is possibly because they were new appointees in Smart Schools or they could not attend training for some reason or another.

Table 6:26 shows the sources of computers and Internet training received by the teachers in this study.

Table 6:26 Training on Computers Programmes and Internet Resources

Resources and Programmes	Never	Self-training	With colleague	Commercial training	School training	Ministry training
Internet	14 14%	40 40%	30 30%	1 1%	15 15%	1 1%
School networking	28 28%	5 5%	31 31%	1 1%	35 35%	1 1%
Internet conferencing	51 51%	18 18%	14 14%	2 2%	15 15%	1 1%
E-mail	9 9%	33 33%	30 30%	3 3%	25 25%	1 1%
Word processing	15 15%	47 47%	20 20%	4 4%	11 11%	4 4%
Databases	22 22%	26 26%	27 27%	5 5%	18 18%	3 3%
Spreadsheets	52 52%	15 15%	17 17%	3 3%	11 11%	3 3%
Educational software	41 41%	13 13%	17 17%	3 3%	23 23%	4 4%
Online information	27 27%	31 31%	18 18%	2 2%	20 20%	3 3%
Others	93 93%	3 3%	2 2%	0 0%	3 3%	0 0%

In general Table 6:26 shows that the teachers received less training in schools and through the Ministry of Education compared to self-training and training with colleagues. The data also reveals quite a significant number of teachers had never received training in particular computer programmes.

The above table shows that most of the teachers learned by themselves or through their colleagues on how to use the Internet and such applications as Internet conferencing, email and online. Other computer software applications like Microsoft Word and Databases had also been self-taught and/or through a colleague.

Not many of the Islamic Education teachers in this study had opportunities to attend computer training courses conducted by schools and the Ministry of Education. The data shows only an average of 3% of the teachers had trained directly under the Ministry of Education. However, quite a significant number of teachers had received training from their schools on certain computer programmes like school networking.

It was surprising that such a big percentage of the teachers had never received any training on certain types of applications and online facilities like spreadsheets, educational software and Internet conferencing. 41% of the teachers revealed that they never received any training on how to use educational software a situation which could potentially prevent them from using software in their classroom.

Some Internet resources were very popular and most of the teachers had had their training in these applications. Most of the respondents admitted they had learnt how to use the Internet and e-mail. Word-processing training was also very popular among teachers possibly because of its frequent use in schools.

Table 6:27 shows the number of hours teachers spent using computers in one week.

Table 6:27 Hours Use of Computers in One Week

	Frequency	**Percent %**
0 hr	73	73
1 hr	15	15
2 hrs	4	4
3 hrs	1	1
4 hrs	2	2
5 hrs	1	1
6 hrs	3	3
14 hrs	1	1
25 hrs	1	1

The data shows that majority of the respondents did not use the computer every week. This is quite surprising given the fact that the Smart School initiative encourages teachers to use computers regularly in their work. Among those who used them every week, most only used them for one hour in a week.

Table 6:28 shows the percentage of teachers who used computer programmes and Internet applications in Smart Schools.

Table 6:28 The Use of Internet Resources and Computers Applications in Smart Schools

Resources and Programmes	Never	Daily	Weekly	Monthly	Semester	Yearly
Internet	33 33%	15 15%	25 25%	22 22%	4 4%	2 2%
School networking	31 31%	28 28%	17 17%	18 18%	4 4%	3 3%
Internet conferencing	52 52%	7 7%	14 14%	18 18%	5 5%	5 5%
E-mail	31 31%	15 15%	23 23%	22 22%	7 7%	3 3%
Word processing	16 16%	51 51%	19 19%	12 12%	2 2%	1 1%
Databases	25 25%	20 20%	22 22%	20 20%	9 9%	5 5%
Spreadsheets	55 55%	6 6%	18 18%	10 10%	7 7%	5 5%
Educational software	46 46%	2 2%	20 20%	20 20%	11 11%	2 2%
Online resources	36 36%	5 5%	25 25%	19 19%	10 10%	6 6%
Others	97 97%	0 0%	1 1%	3 3%	0 0%	0 0%

In general, Table 6:28 show a quite significant number of teachers did not use computers and the Internet in Smart Schools. Among those who did use computers and the Internet, most of them used it monthly or weekly.

By far the most popular computer software among teachers was word-processing. 51% of the teachers said that they used it daily. The teachers also used school networking regularly. In Smart Schools, school networking like SSMS (Smart Schools Management System) was used by the teachers to key-in their students` daily attendance and to manage their records. Database programmes had also been used regularly by the teachers. The Internet and email were also popular among teachers and most of them used them at least once a month.

Table 6:28 also shows that some computer programmes and Internet resources were not very popular among teachers. The most unpopular programmes and resources were spreadsheets, Internet conferencing and educational software. This probably reflects how little training they had received in these three areas of computer skills as shown in Table 6:26.

The finding shows that 46% of the teachers had never used educational software in Smart Schools. This is almost identical with the percentage who had never learned how to use educational software as shown in Table 6:26. This raise a question whether there is any possibility that those who never use educational software from time to time in Smart Schools were the same teachers who had not been trained in this area.

6.3.3 Teachers' Attitudes toward Smart School Initiative

Table 6:29 shows teachers attitudes with regard to the Smart School initiative.

Table 6:29 Teachers' Attitudes toward Smart School Initiative

C: Teachers' Attitudes on Smart Schools	**SD**	**D**	**U**	A	SA
12 It something that I really need	1 1%	4 4%	2 2%	61 61%	33 33%
13 It is a chance to get some training in computer literacy	1 1%	5 5%	7 7%	58 58%	30 30%
14 I like to get involve in the Smart Schools' project	0 0%	6 6%	6 6%	65 65%	24 24%
15 It would be more useful for me	0 0%	6 6%	6 6%	67 67%	22 22%
16 It is very interesting for me	1 1%	3 3%	8 8%	61 61%	28 28%
17 I believe Smart Schools will be successful	1 1%	5 5%	27 27%	49 49%	19 19%
18 It is a teaching change that is worth a try	0 0%	1 1%	13 13%	66 66%	21 21%
19 I just do what principal tell to do	8 8%	31 31%	12 12%	43 43%	7 7%
20 I am afraid of losing control in my class	20 20%	44 44%	23 23%	12 12%	2 2
21 I was more comfortable before we had Smart Schools	13 13%	37 37%	24 24%	24 24%	3 3%
22 I doubt I can fulfil the goals of Smart Schools	7 7%	38 38%	36 36%	18 18%	2 2%
23 There is too much work in Smart Schools	4 4%	29 29%	27 27%	21 21%	20 20%

As in the previous students' data analysis, there were three levels of respondents' attitudes towards educational change in Smart Schools, the positive, the negative and the neutral. There were twelve questions posted to the teachers in this section, C12-18, which reflects positive attitudes, C19 is neutral, and C20-23 reflects negative attitudes. Overall, there were more positive than negative statements. This is consistent with the focus groups' findings.

In general, the findings show that the teachers overwhelmingly welcomed the Smart School initiative. Most teachers agreed that they needed a new initiative like Smart Schools and they were very positive and warm towards the initiative. These teachers felt that the educational changes promoted by the Smart School initiative would be beneficial and useful in their work. They know that this initiative will open the door for them to the new technology in ICT. This is clearly indicated by statement C13 in Table 6.29 which shows that the vast majority of teachers (88%) agreed that the Smart School project had given them a chance to obtain training in computer literacy. The data for statements C12 to C16 consistently show that above 88% of Islamic Education teachers were very excited with the prospects of the Smart School initiative. They felt it was a very important change for the Malaysian education system.

However, did they think that this initiative will be successful? Statement C17 shows that only 65% of the teachers believed that the Smart Schools' project will lead to successful change in Malaysian education. This figure is slightly down on those who welcome the change and shows a significant number of teachers are doubtful about the initiative proving successful. Nevertheless statement C18 shows that 87% of the respondents said it is worth a try to change conventional teaching practices as exemplified by the Smart School initiative.

It is very interesting to note that half of the teachers agreed that they just follow what principal tells them to do. This means a significant number of teachers just follow the system, neither accepting nor rejecting changes in their schools.

Statements C20-23 show a mixed reaction from the teachers. The number who disagreed with the statements decreased sharply from the suggestion of losing control in their classrooms compared to workload burdens in schools: 64% of the teachers said they were not afraid of losing control in their classroom, meanwhile only a third agreed with the suggestion that there is too much work in Smart Schools. This means that even though losing classroom control is not a crucial issue for teachers, 41 of them (41%) said the workload is greater in Smart Schools.

The findings also show a significant number of teachers are undecided on statements C20-23. For example, statement C22 shows that 36% of the teachers have doubts about their capability to fulfil Smart School aims.

6.3.4 Teachers' Attitudes toward Computer Use

This section was designed to measure respondents' attitudes toward the use of computers in teaching and learning. There were twenty statements (statements D24-D43) posted to the Islamic Education teacher respondents. Twelve statements (D24-28 and D37-43) reflect positive attitudes toward computer use in Smart Schools, whereas another eight statements (D29-36) reflect negatives attitudes.

Table 6:30 shows the attitudes of teachers with regard to computer use.

Table 6:30 Teachers' Attitudes toward Computers Technology

D: Teachers' Attitudes on Computer Use	SD	D	U	A	SA
24 I enjoy doing things on a computer	0 0%	2 2%	1 1%	47 47%	51 51%
25 I can learn many things when I use a computer	0 0%	1 1%	1 1%	55 55%	44 44%
26 Using a computer makes me feel more creative	0 0%	2 2%	9 9%	59 59%	31 31%
27 Computer cuts down my teaching preparation time	3 3%	8 8%	9 9%	58 58%	23 23%
28 It's easier to prepare examination questions	0 0%	3 3%	2 2%	50 50%	46 46%
29 Students easily get distracted by computers	9 9%	41 41%	34 34%	15 15%	2 2%
30 Teaching work is more difficult while using computers	8 8%	52 52%	28 28%	12 12%	1 1%
31 I think, it's difficult to complete the syllabus when I teach using the computer	4 4%	32 32%	28 28%	35 35%	2 2%
32 I feel a lack of knowledge to use computer in my classroom	9 9%	41 41%	10 10%	37 37%	4 4%
33 I'm not experienced in using computers in classroom	7 7%	29 29%	11 11%	50 50%	4 4%
34 I am afraid of appearing incompetent in front of students in my classroom	10 10%	41 41%	18 18%	28 28%	4 4%
35 I believe that I can teach better using books than from a computer	5 5%	30 30%	21 21%	39 39%	6 6%
36 Working with computers makes me feel isolated	21 21%	60 60%	6 6%	10 10%	4 4%
37 I need a firm mastery of computers for teaching	0 0%	2 2%	1 1%	57 57%	41 41%
38 If given the opportunity, I want to learn a lot about computers	0 0%	1 1%	4 4%	41 41%	55 55%
39 I prefer to use computers in my teaching	0 0%	13 13%	20 20%	45 45%	23 23%
40 I believe computers will improve students' achievement	0 0%	8 8%	28 28%	42 42%	23 23%
41 If there is a computer in my classroom it would help me to be a better teacher	0 0%	3 3%	20 20%	48 48%	30 30%
42 I believe that computers can be used successfully in Islamic Education subject	0 0%	1 1%	8 8%	49 49%	43 43%
43 I think students enjoy working with computers in Islamic Education	0 0%	2 2%	10 10%	46 46%	43 43%

In general, Table 6:30 shows that the teachers were very positive towards the use of computers and receptive towards its usage in Islamic Education. However, they also had some reservations about the use of computers in classrooms. The issues of lack of experience and confidence, lack of knowledge and skills, and time constraints in delivering a heavy syllabus were among the obstacles working against the teachers' use of computers in their classrooms.

Statements D24 to D28 show that the attitudes of respondents were very positive toward computer use. Over 90% of the teachers enjoyed using them. They learnt many things from them, became more creative, and prepared their examination questions more easily. More than 80% agreed that the computer helps them to prepare lessons quicker than before. These percentages were very high. They show that Islamic Education teachers really appreciated the impact of the computer in their daily work. However, the percentage decreased slightly for statement D27. Perhaps some of them doubted the ability of a computer to help in lesson preparation because it was not a regular teaching resource.

A significant number of teachers were agreed that they lacked experience. 54% of them admitted that they had no experience using computers in the classroom and 41% said that they lacked sufficient knowledge. Lack of experience and knowledge may lead toward lack of confidence to use computers. A significant number of teachers were also afraid to be seen as incompetent: they did not have sufficient confidence to teach in front of their classes. Moreover, 45% of the teachers agreed that they trusted books more than a computer in the teaching of their students. This feeling of safety in the use of textbooks as the medium for teaching is matched by their students' faith in textbooks as was found in the Focus Group study.

Another barrier in incorporating computers was the time constraints for delivering the heavy syllabus. 37% of the teachers agreed that it was difficult to finish the syllabus using computers. They were not convinced that they could deliver the syllabus in time by using computers. This is consistent with the concern raised by respondents in the Focus Group study.

However, the table also shows that half of the teachers disagreed that computers distract the students from learning. This problem was frequently raised by the teachers in the Focus Group interviews and this study shows only a small number of them agreed that the computer was able to distract students from learning. The findings also show that only a small number of teachers agreed that the computer was difficult to use in teaching and only a small number of them believed that working with computers isolated them from others.

The findings also show that almost all the teachers recognized the need to possess computer skills for teaching and wanted to learn more about computers. However, the number of teachers who preferred to use computer in teaching was slightly down. This means that even though a high percentage of teachers admitted the importance of acquiring computer skills and knowledge, few of them were ready to use computers in their classroom and even though they believe that they can improve their students' achievement.

The findings also show that most of the teachers were convinced that computers can be used successfully in teaching Islamic Education. They also believed that students would enjoy learning using computers in Islamic Education. This shows that the teachers were positive about the future of computer use in Islamic Education.

6.3.5 Teachers' Attitudes with regard to Smart Schools' Curriculum

Table 6:31 shows the attitudes of teachers with regards to the Smart School curriculum.

Table 6:31 Teachers' Attitudes with regard to Smart Schools' Curriculum

E: Teachers' Attitudes on Curriculum	SD	D	U	A	SA
44 It should emphasis on knowledge acquisition	2 2%	0 0%	5 5%	51 51%	43 43%
45 It should emphasis a balanced mental, emotional, spiritual and physical development	1 1%	0 0%	4 4%	43 43%	53 53%
46 It should develop creative thinking	1 1%	0 0%	2 2%	49 49%	49 49%
47 It should teach students how to make decisions	1 1%	0 0%	5 5%	59 59%	36 36%
48 It should teach students how to solve problems	1 1%	1 1%	4 4%	58 58%	37 37%
49 It should promote IT competency	1 1%	1 1%	2 2%	55 55%	42 42%
50 It should develop proficiency in an international language	2 2%	4 4%	13 13%	48 48%	34 34%
51 It should inculcate good values	2 2%	2 2%	10 10%	42 42%	45 45%

In general, the table shows that the attitudes of respondents were very positive toward the Smart Schools' curriculum. Statements D44-49 show overwhelmingly favourable reactions from the teachers toward the concept of the new curriculum in Smart Schools. Over 95% of teachers agreed that the curriculum should emphasise knowledge acquisition, a balanced development, a creative thinking approach, a decision-making approach, a problem-solving approach and IT competency.

However, the percentage of 'strongly agree' and 'agree' responses was slightly decreased for items D50 and D51 where only 82% agreed that the curriculum should develop proficiency in an international language and 87% agreed that the Smart School curriculum should inculcates good moral and values. However, this figure still indicates a very positive attitude of the teachers.

6.3.6 Teachers' Attitudes toward Smart Schools' Teaching and Learning Approach

Table 6:32 shows the percentage of teachers with regard to the teaching and learning approach in Smart Schools

Table 6:32 Teachers' Attitudes toward Smart Schools' Teaching and Learning

Teachers' Attitudes on Teaching and Learning	**SD**	**D**	**U**	**A**	**SA**
52 Students easily get access to the relevant learning materials in the Internet	5 5%	4 4%	7 7%	60 60%	25 25%
53 Students easily get access topics of interest without being tied down to a rigid curriculum	3 3%	7 7%	10 10%	64 64%	17 17%
54 Students can learn at their own pace without being held back by slower students	3 3%	5 5%	15 15%	60 60%	18 18%
55 There are enough learning materials to help the students	6 6%	12 12%	23 23%	49 49%	11 11%
56 There are more two-way communications	2 2%	9 9%	17 17%	57 57%	16 16%
57 Teaching has met the students' needs	2 2%	7 7%	17 17%	58 58%	17 17%
58 Classroom activities are more interesting	2 2%	3 3%	7 7%	65 65%	24 24%
59 Teaching is more relevant to students' interest	2 2%	2 2%	10 10%	68 68%	19 19%
60 Students attained better results in exams	3 3%	4 4%	38 38%	44 44%	12 12%
61 Students made significant progress in learning	2 2%	5 5%	29 29%	49 49%	16 16%
62 Students interact better with others in classroom	2 2%	7 7%	21 21%	58 58%	13 13%
63 Students work collaboratively in groups	2 2%	6 6%	9 9%	67 67%	17 17%
64 Students are more motivated in learning	2 2%	2 2%	9 9%	63 63%	25 25%

In general, the table shows that most of the teachers agreed with the teaching and learning approach in Smart Schools. However, a significant number of teachers were undecided on the issue of students' achievement, students' interaction, and learning materials.

The finding shows that the teachers agreed that the students had benefited from the learning strategies in Smart Schools. They said that the students were able to get access to relevant learning materials on subjects of interest to them and to learn at their own pace. There were also enough learning materials to help them in Smart Schools. These findings are consistent with the objectives and strategies of learning in Smart Schools as outlined by the Ministry of Education in the Smart School blueprint document.

Islamic Education teachers also agreed that the students benefited from a good classroom atmosphere and interaction within the Smart School classroom. Most teachers agreed that there was more two-way communication within the classroom, that the classroom activities were more interesting, that the students interacted better with others and were able to work collaboratively in groups, and that they were more motivated to learn. These findings reflect the previous findings from the students.

The findings also shows significant number of teachers were undecided on the issues of students' achievement, students' interaction, and learning materials. 38% of them were unsure that their students attained better exam results and 29% were unsure their students had made significant progress in learning. This may possibly be due to the Smart School initiative being a relatively new phenomenon and thus make judgement difficult.

6.3.7 The Needs of Teachers in Computers, Internet and Software

Table 6:33 shows teachers' needs with regard to computer, Internet and software use.

Table 6:33 Teachers' Attitudes toward the Use of Technology, Internet and Software

F: Teachers' Attitudes on Technology, Internet and Software	SD	D	U	A	SA
65 Technology should integrate in Islamic Education	2 2%	0 0%	1 1%	46 46%	52 52%
66 I would like more IT resources to help my teaching	2 2%	0 0%	1 1%	46 46%	52 52%
67 I would like more resources that illustrate how to integrate technology into the curriculum	2 2%	1 1%	0 0%	50 50%	48 48%
68 I would like to work with colleagues to become more proficient using technology	2 2%	1 1%	0 0%	54 54%	44 44%
69 I would like more time to learn to use computers	2 2%	5 5%	4 4%	37 37%	53 53%
70 I would like more time to access the Internet	2 2%	8 8%	4 4%	57 57%	30 30%
71 I would like to be able to try out technology-enhanced in my classroom	3 3%	2 2%	2 2%	68 68%	26 26%
72 I would like more time to incorporate the technology in classroom	2 2%	6 6%	12 12%	55 55%	26 26%
73 I would like more software that is curricular-based	2 2%	1 1%	1 1%	44 44%	53 53%
74 I would like more software that is examination-based	2 2%	0 0%	1 1%	41 41%	57 57%
75 I would like more technical support to keep the computers working	2 2%	7 7%	1 1%	57 57%	34 34%

In general, the result shows that the majority of the teachers agreed that they had many needs concerning the use of ICT in Smart Schools. The data shows that there was a need to integrate ICT in the classroom learning. The teachers agreed that Islamic Education should be integrated with technology, that they need more IT resources, and that there is a need for more resources that illustrate how to integrate technology into the curriculum. They also said that they would like to try out technology in the classroom (G71). These responses show that Islamic Education teachers had a great desire to maximise the potential of technology and ICT in their classrooms and in the curriculum.

The findings show that the teachers need more time to spend on computers and the Internet. 90% of them agreed that they needed more time to learn how to use computers, 87% of them needed more time to access the Internet, and 81% said they needed more time to incorporate technology in the classroom.

The data also shows that the teachers needed more software for teaching and learning purposes in Smart Schools. 97% of the respondents said they needed more software that is curricular-based while 97% said they needed more software that is examination-based. This finding is consistent with the previous finding from the focus groups which revealed the need for software that supports the syllabus and subject-teaching

Technical support to operate technology and ICT was also desired by the teachers. 91% of them agreed that they needed technical support when their work involved the use of technology. Meanwhile 98% of them agreed that they liked to work with their colleagues to enhance their skills in ICT.

6.4 T-Test, One-way ANOVA and Correlation Analysis of Survey Study among Islamic Education Teachers

6.4.1 The T-test to investigate the Differences between Genders toward the Attitudes of Islamic Education Teachers

Table 6:34 below shows the result of the T-test to investigate the differences between males and females and their attitudes toward the Smart School initiative, the use of computer, the curriculum, the teaching and learning process and their needs.

Table 6:34 T-test between Gender and Attitudes

Independent Samples Test

		evene's Test fo uality of Varianc		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	g. (2-taile	Mean ifferenc	Std. Erro ifferenc	Lower	Upper
C Attitude Tow Smart Schools	Equal varia assumed	.024	.878	2.340	99	.021	.22743	.09719	.03457	.42028
	Equal varia not assume			2.298	52.499	.026	.22743	.09899	.02884	.42601
D Attitude Tow Computers	Equal varia assumed	.582	.447	4.039	99	.000	.37930	.09390	.19297	.56562
	Equal varia not assume			3.836	48.978	.000	.37930	.09887	.18060	.57799
E Attitude Tow Curriculum	Equal varia assumed	4.542	.036	.056	99	.955	.00728	.12984	.25035	.26491
	Equal varia not assume			.046	37.606	.964	.00728	.15942	.31557	.33013
F Attitude Tow Teaching and L	Equal varia assumed	.045	.833	1.790	99	.077	.25204	.14083	.02740	.53148
	Equal varia not assume			1.687	48.274	.098	.25204	.14936	.04822	.55230
G Technology	Equal varia assumed	1.281	.261	1.700	99	.092	.23210	.13652	.03880	.50299
	Equal varia not assume			1.488	42.090	.144	.23210	.15599	.08268	.54687

The result shows that there were significant effects ($P<0.05$) of gender on the teachers' attitudes on the Smart School initiative ($n=101$, $t=2.340$, $P=0.021$) and the use of computer in Smart Schools ($n=101$, $t=4.039$, $P=0.000$). This means we can infer that both male and female Islamic Education teachers in this study were different in term of their attitudes toward the Smart School initiative and the use of computer in Smart Schools. The overall means also indicate that male teachers had a better attitude towards the Smart School initiative ($M=3.869$, $SD=.460$) and the use of computer in Smart Schools ($M=4.080$, $SD=.469$) compared to female teachers (see Appendix 6).

The result also shows that there were no significant effects ($P>0.05$) of gender on the students' attitudes on the curriculum ($n=101$, $t=0.046$, $P=0.964$), the teaching and learning process in Smart Schools ($n=101$, $t=1.790$, $P=0.077$) and their technology needs ($n=365$, $t=1.700$, $P=0.092$). We can infer from this that both male and female Islamic Education teachers in this study had similar attitudes toward the curriculum, the teaching and learning process in Smart Schools and their technology needs.

6.4.2 The T-test to investigate the Differences between Trained Teachers and Untrained Teachers and their Attitudes towards Smart Schools

Table 6:35 below shows the result of the T-test to investigate the differences between trained and untrained teachers and their attitudes toward Smart School initiative, the use of computer, the curriculum, the teaching and learning process and their needs.

Table 6:35 Correlation between Smart Schools Training and Attitudes

Independent Samples Test

		evene's Test fo uality of Varianc		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	g. (2-taile	Mean ifferenc	td. Erro ifferenc	Lower	Upper
C Attitude Tow Smart Schools	Equal varia assumed	.176	.675	.906	99	.367	.08548	.09431	.10164	.27260
	Equal varia not assume			.890	71.221	.376	.08548	.09602	.10597	.27693
D Attitude Tow Computers	Equal varia assumed	.076	.783	-.513	99	.609	-.04928	.09599	.23975	.14119
	Equal varia not assume			-.516	76.439	.607	-.04928	.09551	.23949	.14092
E Attitude Tow Curriculum	Equal varia assumed	.581	.448	3.270	99	.001	.38255	.11699	.15042	.61468
	Equal varia not assume			2.943	54.676	.005	.38255	.12996	.12206	.64304
F Attitude Tow Teaching and L	Equal varia assumed	.024	.877	1.083	99	.281	.14615	.13491	.12155	.41385
	Equal varia not assume			1.085	75.678	.281	.14615	.13468	.12211	.41440
G Technology	Equal varia assumed	1.010	.317	.625	99	.533	.08193	.13110	.17820	.34205
	Equal varia not assume			.588	62.335	.559	.08193	.13936	.19662	.36047

The result shows that there was only one statistically significant difference ($P<0.05$) between those who had had training and those who had not had training in the beginning of Smart Schools on the Islamic Education teachers' attitudes. This was their attitude toward the curriculum ($n=101$, $t=3.270$, $P=0.001$). This means we can infer that the trained teachers were different from the untrained teachers in this study with regard to their attitude toward the curriculum in Smart Schools.

The overall means also indicate that the male Islamic Education teachers had a better attitude towards the curriculum (M=4.443, SD=.468) compared to the female Islamic Education teachers (M=4.060, SD=.705). Please refer to Appendix 6.

The result also shows that there were no significant differences of attitude (P>0.05) between those who had had training and those who had not had training in the beginning of Smart Schools concerning the Smart School initiative (n=101, t=0.906, P=0.367), the use of computers in Smart Schools (n=101, t=-.513, P=0.609), the teaching and learning process in Smart Schools (n=101, t=1.083, P=0.281) and their technology needs (n=101, t=0.625, P=0.533). We can infer from this that both male and female Islamic Education teachers in this study held similar attitudes toward the Smart School initiative, the use of computers in Smart Schools, the teaching and learning process and their technology needs.

6.4.3 The ANOVA Test to investigate the Differences between Schools and their Teachers' Attitudes toward Smart Schools

Table 6:36 below shows the result of ANOVA to investigate the differences between schools and their attitudes toward the Smart School initiative, the use of computer, the curriculum, the teaching and learning process and their needs.

Table 6:36 The Differences of Attitudes between Smart Schools

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
C Attitude Towards Smart Schools	Between Groups	2.862	11	.260	1.290	.243
	Within Groups	17.952	89	.202		
	Total	20.814	100			
D Attitude Towards Computers	Between Groups	2.423	11	.220	1.031	.427
	Within Groups	19.022	89	.214		
	Total	21.444	100			
E Attitude Towards Curriculum	Between Groups	3.429	11	.312	.873	.569
	Within Groups	31.770	89	.357		
	Total	35.198	100			
F Attitude Towards Teaching and Learr	Between Groups	4.696	11	.427	.998	.454
	Within Groups	38.053	89	.428		
	Total	42.749	100			
G Technology Nee	Between Groups	2.582	11	.235	.558	.858
	Within Groups	37.468	89	.421		
	Total	40.050	100			

The results show that there no statistical differences could be found between all the schools involved in this study with regards to their attitudes toward the Smart School initiative (n=101, F=1.290, P=0.243), the use of computers (n=101, F=1.031, P=0.427), the curriculum (n=101, F=0.873, P=0.569), the teaching and learning process (n=101, F=0.998, P=0.454) and their technology needs (n=101, F=0.558, P=0.858). This means we can infer that all schools held similar attitudes toward the Smart School initiative, the use of computers, the curriculum, the teaching and learning process and their technology needs.

6.4.4 The ANOVA Test to investigate the Differences between Islamic Education Teachers' Age and their Attitudes toward Smart Schools

Table 6:37 below shows the result of ANOVA to investigate the differences between teacher age groups and their attitudes toward the Smart School initiative, the use of computer, the curriculum, the teaching and learning process and their technology needs.

Table 6:37 The Differences between Teachers' Age

ANOVA

		Sum of Squares	df	lean Square	F	Sig.
Attitude Towards Schools	Between Gro	.505	5	.101	.472	.796
	Within Group	20.310	95	.214		
	Total	20.814	100			
Attitude Towards Computers	Between Gro	1.948	5	.390	1.898	.102
	Within Group	19.496	95	.205		
	Total	21.444	100			
Attitude Towards Curriculum	Between Gro	1.592	5	.318	.900	.484
	Within Group	33.606	95	.354		
	Total	35.198	100			
Attitude Towards Teaching and Lea	Between Gro	2.083	5	.417	.973	.438
	Within Group	40.665	95	.428		
	Total	42.749	100			
Technology Need	Between Gro	1.938	5	.388	.966	.443
	Within Group	38.112	95	.401		
	Total	40.050	100			

The results show that no statistical differences could be found between the age groups among the Islamic Education teachers involved in this study with regard to their attitudes toward the Smart School initiative (n=101, F=0.472, P=0.796), the use of computers (n=101, F=1.898, P=0.102), the curriculum (n=101, F=0.900, P=0.484), the teaching and learning process (n=101, F=0.973, P=0.438) and their technology needs (n=101, F=0.966, P=0.443). This means we can infer that all Islamic Education teacher age groups held similar attitudes toward the Smart School initiative, the use of computers, the curriculum, the teaching and learning process and their technology needs.

6.4.5 The ANOVA Test to investigate the Differences between Teachers' Teaching Experiences and their Attitudes toward Smart Schools

Table 6:38 below shows the result of ANOVA to investigate the differences between teacher teaching experiences and their attitudes toward the Smart School initiative, the use of computer, the curriculum, the teaching and learning process and their technology needs.

Table 6:38 The Differences between Teaching Experiences

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Attitude Towards Sma Schools	Between Groups	.495	4	.124	.585	.674
	Within Groups	20.319	96	.212		
	Total	20.814	100			
Attitude Towards Computers	Between Groups	1.448	4	.362	1.738	.148
	Within Groups	19.996	96	.208		
	Total	21.444	100			
Attitude Towards Curriculum	Between Groups	1.082	4	.270	.761	.553
	Within Groups	34.117	96	.355		
	Total	35.198	100			
Attitude Towards Teaching and Learnin	Between Groups	3.026	4	.757	1.828	.130
	Within Groups	39.723	96	.414		
	Total	42.749	100			
Technology Needs	Between Groups	.754	4	.188	.460	.765
	Within Groups	39.296	96	.409		
	Total	40.050	100			

The results show that no statistical differences could be found between the Islamic Education teachers in this study when they were grouped according to their years of teaching experience with regard to their attitudes toward the Smart School initiative (n=101, F=0.585, P=0.674), the use of computers (n=101, F=1.738, P=0.148), the curriculum (n=101, F=0.761, P=0.553), the teaching and learning process (n=101, F=1.828, P=0.130) and their technology needs (n=101, F=0.460, P=0.765). This means we can infer that all teachers who had been grouped according to their length of teaching experience, from one year up to more than 15 years, held similar attitudes with regard to the Smart School initiative, the use of computers, the curriculum, the teaching and learning process and their technology needs.

6.4.6 The ANOVA Test to investigate the Difference between Academic Qualifications among Islamic Education Teachers and their Attitudes

Table 6:39 below shows the result of the ANOVA test to investigate differences between teachers with different academic qualifications and their attitude with regard to the Smart School initiative, the use of computers, the curriculum, the teaching and learning process and their technology needs.

Table 6:39 Correlation between Academic Qualifications

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Attitude Towards Sr Schools	Between Grou	1.524	3	.508	2.554	.060
	Within Groups	19.290	97	.199		
	Total	20.814	100			
Attitude Towards Computers	Between Grou	.762	3	.254	1.191	.317
	Within Groups	20.682	97	.213		
	Total	21.444	100			
Attitude Towards Curriculum	Between Grou	1.385	3	.462	1.325	.271
	Within Groups	33.813	97	.349		
	Total	35.198	100			
Attitude Towards Teaching and Learn	Between Grou	1.108	3	.369	.860	.464
	Within Groups	41.641	97	.429		
	Total	42.749	100			
Technology Needs	Between Grou	.891	3	.297	.736	.533
	Within Groups	39.159	97	.404		
	Total	40.050	100			

The results show that there were no statistical differences to be found between the groups in this study of Islamic Education teachers with different academic qualifications with regard to their attitudes toward the Smart School initiative ($n=101$, $F=2.554$, $P=0.060$), the use of computers ($n=101$, $F=1.191$, $P=0.317$), the curriculum ($n=101$, $F=1.325$, $P=0.271$), the teaching and learning process ($n=101$, $F=0.860$, $P=0.464$) and their technology needs ($n=101$, $F=0.736$, $P=0.533$).

This means we can infer that, irrespective of the level of their academic qualifications, ranging from Masters graduates to Teaching Certificate holders, the Islamic Education teachers shared similar attitudes with regard to the Smart School initiative, the use of computers, the curriculum, the teaching and learning process and their technology needs.

6.4.7 The Pearson Correlation Test to investigate the Relationship between Islamic Education Teachers' Attitudes

Table 6:40 below shows the Pearson correlation test to investigate the relationship between attitudes of the teachers.

Table 6:40 Correlation between Attitudes

Correlations

		C Attitude Towards Smart Schools	D Attitude Towards Computers	E Attitude Towards Curriculum	F Attitude Towards Teaching and Learning	Technology Needs
C Attitude Towards Smart Schools	Pearson Correlation	1	.383**	.243*	.338**	.022
	Sig. (2-tailed)		.000	.014	.001	.829
	N	101	101	101	101	101
D Attitude Towards Computers	Pearson Correlation	.383**	1	.360**	.210*	.120
	Sig. (2-tailed)	.000		.000	.035	.232
	N	101	101	101	101	101
E Attitude Towards Curriculum	Pearson Correlation	.243*	.360**	1	.434**	.452**
	Sig. (2-tailed)	.014	.000		.000	.000
	N	101	101	101	101	101
F Attitude Towards Teaching and Learning	Pearson Correlation	.338**	.210*	.434**	1	.576**
	Sig. (2-tailed)	.001	.035	.000		.000
	N	101	101	101	101	101
G Technology Needs	Pearson Correlation	.022	.120	.452**	.576**	1
	Sig. (2-tailed)	.829	.232	.000	.000	
	N	101	101	101	101	101

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The result shows that there was quite a strong relationship between their attitude towards teaching and learning and their attitude towards their technology needs (r=.576, P<0.001). This means that those who had more positive attitudes toward teaching and learning tended to have more positive attitudes toward technology needs.

The result also shows that there was a modest relationship between the attitude toward teaching and learning and the attitude toward the curriculum ($r=.434$, $P<0.001$). This means that those who had more positive attitudes toward teaching and learning tended to have a more positive attitudes toward the curriculum in Smart Schools. Other variables showed a weak relationship even though there was a significant correlation between all variables.

6.5 Summary

This chapter presents the data from the survey study conducted following the focus group sessions. The data is divided into two sets, one for the students and another for the teachers. The result of this data is presented in two sections, a descriptive and a correlation study. The descriptive study shows the percentage of teachers and students involved in this study. It also highlights the differences in computer use and their knowledge about applications. The findings show that the use of computers among participants was very low and this finding is different from the indications from the focus groups. However, many respondents were very positive toward the use of computers in Islamic Education and this reinforced the attitudes expressed in the previous focus groups.

The correlation study, using T-Test, One Way ANOVA and Correlation analysis, was also carried out to investigate the differences between variables in each set of data. However, this study did not intend to make a comparison between the two sets of data. The findings show that there were significant effects of gender, training and school on the use of computers among students. Surprisingly, only one variable shows a significant effect on the use of computers among teachers and variables such as training, school, age, teaching experience and academic qualification did not affect their attitude toward the use of computer. In the focus group interviews previously, the teachers had clearly stated the lack of training as one barrier in using computers. In the next study, I aimed to investigate further some issues regarding the barriers in incorporating ICT in Islamic Education as one of the subjects taught in Smart Schools.

Chapter 7 Findings of In-depth Interview Study

This chapter discusses the findings from the in-depth interviews carried-out in 5 Smart Schools which involved 5 students and 6 Islamic Education teachers. The interviews were carried out to seek clarification and to probe further the findings from the previous phases of study i.e. the focus group studies and the survey study. The issues raised in these interviews were based on the results of the previous studies which are very important as they allowed certain points to be clarified and confirmed by the respondents.

7.1 Lack of Access to the Computers

All students in this study believed that their engagement with ICT was not frequent and 4 of the students (S1, S2, S3 and S5) expressed their dissatisfaction with the restricted access to the computer in Smart Schools. A student (S5) said that teachers "hardly use computers in the classroom, not even once in a month". According to this student, Islamic Education teachers rarely use the computer labs and prefer to use "transparency and video". One of the Islamic Education teachers (T1) admitted that she only used the computer lab once for teaching and learning: "I just took my students to the computer lab once because there are too many hurdles. We are interested but we never get the chance".

There were various reports from the students about the frequency of access to the computers in their schools. One student (S3) reported that up to the present time they had used the computer lab less than 4 times in the year and for most of those lessons they had been studying Science: "Not sure, may be because we rarely use it. May be two, three or four times only. Most of them for Science subject only". Another student (S4) said that they use the computer at least twice a month and that there is less use of computers during examination time: "Twice a month. Rarely used during examination time because we learn by ourselves using a drill technique". However, the most frequent use of computer in one school was once in a week: "Once a week, we use computers. The problem here is it's too slow. We have to book the computer labs first before we use one. We only use it if we have a presentation" (S2)

The amount of access to computers seemed to be one of the important factors which contributed to the degree of the participants' confidence in using computers in Smart Schools. Student (S1) said that the problem of lack of access to the computers may have affected their confidence in using computers and ICT: "We were rarely using the computer lab. If we use it regularly it will boost our confidence". Another student (S3) was confident that the Smart School initiative will succeed if the schools use the computers frequently: "We can succeed if our school uses computers. However our school rarely does use them. For me, the use of the computer made my work easier, I can do my homework using computer."

The present policy in Smart Schools to have dedicated computer labs seemed to be an important issue which may have contributed towards the lack of access to the computers in Smart Schools. Data from all respondents shows that their schools reserved the computers and hardware in computer labs, and that this caused problems when the teachers wished to use those labs at the same time. According to the teachers (T2 and T4) they had to book the computer labs "one week ahead" and that there were "long queues" to book them. Teachers (T1, T2, T3 and T4) said that in their schools only one or two computer labs were available for teaching and this was obviously not enough to accommodate all the subjects taught in the schools. The small number of labs and the high demand to use them had created "clashes of timetable and problems to find suitable time for everyone" (T4).

In two schools, Islamic Education teachers (T2 and T4) cited that priority was given to those teaching Smart subjects to use the computer labs in the event of any clashes. One teacher (T4) suggested that the computers should be located in the staff room instead of the ICT lab to enhance the use of computers among teachers. However, one teacher (T6) was confident that the computer labs were not the main obstacle for Islamic Education teachers: "No problem. We can create the time table. At the present time, even other subjects like Malay Language, English, Mathematics and Science follow the time table. It's good enough if Islamic Education teachers can bring their students to the labs once a week".

7.2 Lack of Availability

In this study, the most frequently mentioned problem when teachers were asked about obstacles to their use of ICT was the insufficient number of computers available to them. Teachers said the facilities provided did not meet their expectations. One teacher (T4) noted that "only one computer to share with 8-10 teachers is obviously not enough. There is no computer in teacher's room, we have to walk to the ICT room and we have to queue to take our turn. It is a waste of our time. We have no confidence in the facilities provided even though we believe computers will make our job easier. Teachers love to use computers but at this moment the situation does not help". This teacher still placed a high value on computers and perceived them to be useful to transform his work.

The lack of computers and software seriously limits what teachers can do in the classroom with regard to the implementation of ICT in Smart Schools. A teacher (T2) admitted that probably using an overhead projector is the most practical solution considering the lack of computer availability in school: "The easier and practical way is to use OHP. What is the point in preparing PowerPoint if there are no computers for display".

Some of the teachers (T1, T2, T3 and T 4) mentioned the lack of ICT resources available at the school, while others (T2, T4 and T6) mentioned the poor quality of the resources that were available. All the teachers said that software was one of the resources needed in Islamic Education. One school took the initiative to buy some Islamic Education software from an unknown "private company" and "salesman" who comes to schools even though the teacher admitted that the quality is poor and not interactive. One teacher (T6) also criticized Smart School software as "slow", "too easy" and "not suitable" for the level of the students. Students (T4 and 5) described some of the educational resources available at the present time as "not attractive and boring" with "too many texts and no graphics".

This study found that some teachers had resisted using and working with the new software introduced by Ministry. They questioned and doubted the software's effectiveness because some of the software did not actually enhance lessons in the classroom. One school was reported as having a screening out and selecting process to ensure software was suitable for use in the classroom. Otherwise, it could affected student motivation and caused a lot of trouble for the teachers in the classroom when students resorted to other websites.

One teacher (T6) said: "In my school, after some observation, we found that some of the software provided by the Ministry of Education is not suitable for boarding school students who are more advanced. We have to screen-out and put aside (the sub-standard software). The slow software made boarding school students bored and therefore they turned to other websites not related to the learning".

Teachers acknowledged that the Government has invested heavily to develop and supply the software. Therefore, they regret what has happened and have taken the initiative to discuss this matter with inspectors from the Ministry every time they come to visit and monitor the implementation of change. One teacher (T6) said:

"We take the initiative to discuss software problems every time the inspectors come to our school because we know that thousands of Ringgit Malaysia (RM) have been invested to develop one item of software, and we have been given lots of software". One teacher (T4) said: "This is wasting of money and at the end of the day we come back to the conventional way".

Teachers interviewed noted that the number of computers in their schools was insufficient. If teachers were asked to continue to implement ICT into their work then they required more computers and appropriate software that is "really compatible with the Islamic Education syllabus" (T1). They also need training to familiarize themselves with it first so that they can guide their students accordingly. One teacher (T4) said: "We don't have training and exposure. That's why we are afraid to use it. We would be really happy to use it if we were trained".

As a result of insufficient computers and almost no Islamic Education software in the Smart Schools, teachers prefer to use books rather than computers which they said are "easy and simple" (T4). Teacher (T2) seemed to try to avoid any problems that could distort his teaching and mentioned there being "too many troubles when using computers for example viruses etc, and the fact that sometimes the technology is not very helpful". Teacher (T1) was afraid that a slight technical problem such as "server down because of thunderstorm" would spoil hours of preparation and she was concerned about the back up system in this situation. Teacher (T4) also admitted that the lack of software and computers led to the lack of self-access study as promoted by Smart School concepts of teaching and learning.

7.3 Exam Orientation

One of the main concerns for the teachers is that the Malaysian education system is still heavily examination-oriented. An examination-orientated system imposes pressure on the teachers and students alike. The examination-based system creates pressure on the teachers who are required to deliver a heavy syllabus load. A teacher (T4) said that he felt pressured, overburdened and "sick" of the new syllabus for Islamic Education. One teacher (T1) said that if teachers cannot deliver they will be blamed. She said: "The students would not be blamed but we are". Therefore, many teachers were reluctant to take the risk of using technology in their lessons.

All teachers in this study admitted that the syllabus is heavy and one of them said the topics discussed were "too deep" (T4). One teacher (T6) said: "In boarding school, we put a target to finish the entire syllabus by July. That's why we don't use all of the Smart School software. We believe we can't meet the deadline if we use it. Some of the software is too slow. Some of the topics took 3 days to finish". Another teacher (T1) also emphasized the importance of meeting the deadline to finish the entire syllabus: "For all boarding schools, they set a very high target to achieve. All syllabuses must be delivered by May or June. If we follow the Smart School's initiative, it will end up in October or November". In Malaysia, the school year begins in January and finishes in November.

Teachers in Smart Schools have been trapped between the Smart School initiative and the pressure of the national examination system. They are required to use Smart School software which they described as "slow and not reliable" and yet at the same time they must ensure their schools produce good results in the examinations. In such a complicated situation, the winner is the latter. One teacher (T1) noted: "At the end of the day, we must admit that people look at the examination results. If we follow the Smart School initiative we would not get 100% A's. We have to admit that we still rely on examination and the examination relies on books. Not all the topics taught are suitable for using Smart Schools' software and sometimes teachers need to explain and elaborate. This is the reality of what happens in Smart Schools. Maybe it looks great but in reality it's not"

The main goal of a school as stated by one teacher is to strive for excellence in academic standards and this can be proved by the examinations results. One teacher (T6) said that ICT literacy is not a main goal in his school, and if it were, it had been achieved a long time ago because all students are computer literate. He said: "All students are highly skilled with computer technologies which they have acquired personally and they are even better with computers than the teachers"

This study found that teachers avoided using computer labs during the periods in which their students were studying and preparing for national examinations. One student (S1) explained that there is very little use of computers by the teachers in upper secondary classes because of the need for examination preparation. One student (S4) mentioned that teachers remain the main source of learning especially for examination preparation and act as the gateway to enlarging their horizon of knowledge and no amount of ICT could ever replace teachers in this respect: "If we don't have a basis for the topic we can't learn through the computers. Definitely, we can't understand, unlike learning through the teachers. We must learn from the teachers and after that we can use the computers for the revision. The computer is just a tool not the main resource. At the end of the day we still need teachers".

Teachers and students alike agreed that examinations are based on books 100% and as a consequence of that computers are not being used for examination preparation as teachers and students are more confident in using books.

7.4 Time Constraint

The constraint of time is one of major concerns for the teachers in their work and teaching using computers is certainly an area which is very much affected by this. Teachers have little time left after spending most of their day time teaching, training and undertaking administrative tasks. The issue of insufficient time in the daily routine goes to the heart of many teacher problems and this has made them reluctant to use computers as a preferred teaching practice. One teacher (T4) said, "I think not only have Smart Schools overburdened their teachers but other schools do as well. We teach 27 periods a week, and in one day we only have free time for 2 or 3 periods, that is the only time for us to mark students' work.

That's why teaching preparation is not too good, except for those who have taught that subject for a long time".

All the teachers said that they do not have enough time to incorporate computers into their daily teaching. One of the teachers (T1) said that preparation to incorporate computers in to their teaching was "very taxing and time consuming". The teachers pointed out that a great deal of work was required in the beginning to prepare attractive learning presentations using PowerPoint. They complained of the lack of time restricting them from preparing materials for the potential use of ICT in the classroom. However, the teachers realized that once the materials are ready they can be used for the next year's lesson as well. One of the teachers (T1) said that unlike their colleagues who teach the Sciences and Mathematics, they have to prepare the materials themselves which they cannot afford to do for every lesson.

One teacher (T5) was concerned about lack of time to learn how to use computers and new technology, how to operate and integrate the Smart Schools system into his lesson and daily work since "the system is very complicated, not easy to use, not user friendly".

Not having enough time makes teachers more sensitive to time and many of them complained that it took 20 minutes to walk to the computer labs, to set up the class and to log on to the computers before they can start their lessons. Therefore it is almost impossible for them to incorporate computers in a normal class time of 40 minutes. They can only be used in "double-period" classes (approximately

1 hour 10 minutes). One student (S2) even said that a double period is not long enough for him to search the Internet.

Students also confirmed that it is very hard to use computers because many of them are old generation computers. As one student (S2) mentioned, it is time consuming to set up the computers at the beginning of every lesson. He recommended school administration to change "Pentium 3 technology" to a new and up-to-date technology. Another student (T4) said even though using computers in learning is very interesting, she preferred to use textbook because the computers are "too slow".

7.5 Computer Distractions

Students were worried that they might be distracted from learning while using computers and the Internet. They said that it was common that students used the Internet to do things not related to their study. One student (S2) said that "too much computer use is not good. There are too many things on the Internet … not much learning but more on playing". This student made his point by saying that during examination time fewer students use computers and only concentrate on books: "At the end of the day, we only use books. Yes, during examination time no one goes to computer class. It's clear that the use is only for playing". Another student (S1) from another school also agreed that computers contributed less to learning: "too little, more on other things like playing games, chatting, emailing, downloading songs, copying and printing song lyrics"

Three students (S1, S2, S4 and S5) in this study believe that computers have a very powerful influence and attraction that can drag students from learning to playing games. Student (S1) said "Students are more attracted towards enjoyment and entertainment. That's what I feel. They just forget everything when using computers. They are not using them for learning". Another student (S5) said, "Students are careful to use computers, too many distractions. You could deviate from learning to playing games while surfing the Internet".

Another student (S2) admitted that playing games was a very popular activity among students while using computers: "It's too many influences, especially games, in fact most of them play games in the one hour computer literacy class. They play games on the Internet. Next week our Islamic Education teacher has asked us to do a presentation, so maybe they will use the computer to do their work, but still some of them will get away with playing games". The most popular activity among male students was playing simulation games on the Internet such as football and pool.

The fact of that the students use computers for playing games is also well known to the teachers and has made them worried. One teacher (T2) said "When students are studying in the labs, they log-on the computers themselves, and then they open other things. They do other work at the same time, that's disruption. We tell them not to do this, but they do it themselves". Students give many opportunities for their teachers to notice their lack of discipline in the classroom and alert them to the dangers of over-indulgence on games.

In another school, one teacher (T5) blamed the unattractive software provided by the Ministry for turning students to other websites. He said that big mirrors have been put up in front and at the back of computer labs so that teachers can see what is appearing on a student's computer screen. This shows teachers' lack of confidence and trust in their students while they are using computers in labs.

Students also stated that one of the reasons why teachers were not using computers was because they were misused by the students. One student (S1) said "Some of them use the computers rightly and some of them misuse it. I'm not joining them. When I arrive they are already playing games and downloading. That's why the teachers are not interested in turning on the computers. The students misuse the computers, listening to music and searching for lyrics, not actually learning".

Another student (S5) agreed that the impact of computer use in learning was not high because of the misuse of computers: "The effectiveness of computer use is low because sometimes students at this age cannot be trusted. Teachers let them use computer technology to search for assignment materials, but they do other things. That's why it's not very effective. Student's attitudes will determine the effectiveness of the technology. Not all the students follow what teachers ask them to do."

According to one student (S1) his parents are also concerned about the proper use of computers. His parents took the initiative of buying educational software to provide alternatives for their children: "Sometimes, students turn to other things like playing games. In my house my mother bought educational CDs for me. I am personally very reluctant to use computers, I'm afraid that I will deviate to do other things. In my house, I seek permission from my mother before turning on the computers. I want them to look after me when I turn on the computers; I don't want them to be disbelieving in me that I may use it for other things". This student worried that computer games distorted his concentration for studying therefore he was reluctant to use computers regularly.

Other activities like chatting with others online also distract some students. Several students also reported using download items from the Internet that were not related to lessons. Music and songs were cited as an attraction for the students to use computers. Respondents (S1 and S5) admitted that students do search on the Internet for the latest songs and lyrics. All of the respondents believed these activities will distort their study but some of them also believe it could "release tensions and pressures" (S2).

7.6 Lack of Training

One teacher (T4) said that there was no training and exposure to computer use for Islamic Education teachers in his school and the training was focused on teachers who taught the four Smart subjects namely Malay, English, Mathematics and Science: "There is no training for the teachers ... they give training for those involved with Smart subjects only, not for Islamic Education teachers".

Another teacher (T2) in another school also agreed that priority for training was given to Smart subjects teachers, even though his school was very fortunate to have had training from the Department of Islamic Development Malaysia (JAKIM): "For the last 2 years JAKIM arranged a computer course, 3 times, a basic computer literacy course, a word processing course and a PowerPoint course. We sent 2 teachers to the course. Now priority is given to Smart subjects. There's no training for Islamic Education teachers. We have to train ourselves". This teacher also claimed that most of the Islamic Education teachers who are skilful with the technology acquired the knowledge and skills by their own initiative. He himself had spent a substantial amount of money to learn about computers.

One teacher (T6) stated that the ICT teacher has a responsibility to teach other teachers. ICT teachers were appointed specifically to enhance the use of ICT in Smart Schools: "The ICT teacher is a full-timer teacher. This post was specifically created for them by Ministry of Education. They are full-time trainers. They don't have any teaching workload like other teachers". This teacher suggested that ICT teachers should make a proactive move to set a time-table for training: "If they don't want to be in that room all day long, alternatively they can set a timetable, let says from 10-12, so that any teachers who want to go can go there, and those who have problems can go straight to the ICT labs to get advice". This teacher also remarked the purpose of sending teachers outside to get trained was that when they come back to school, they teach other colleagues.

One of the teachers (T4) explained that the role of the ICT teacher was more to train Smart Subject teachers: "That's true. We do have a teacher for staff development, for all, and more on Smart subjects. We have just bought the Jawi (Arabic alphabet for Malay) software and al-Quran software with the special Arabic keyboard. The ICT teacher just showed us how to use it very quickly". This teacher also said staff need assistance to install the software and keep it working.

Another teacher (T5) was very open-minded and positive regarding the issue of training. He agreed that there is a lack of training for Islamic Education teachers. However he made use of other skilful colleagues who had training from the Ministry: "I get the knowledge from other colleagues, Mathematics and Science teachers. Here, in this school they will inform all teachers. At the beginning, the training was only for four subjects. However we got involved also in some way. The Headmaster was very encouraging and informed all staff about the Smart School development. If there are hand-outs, everybody will get the copies". This teacher also stressed that it is a duty of a Muslim to support and take any benefit from any good efforts and initiatives imposed on them.

7.7 The Unique Nature of the Subject

All teachers agreed that not all the topics in the Islamic Education syllabus are suitable for teaching using computers. One teacher (T5) argued, "I think it depends on the topic, we cannot teach all of them using computers. Sometimes we have to explain, it's faster than using computers. I teach the Hajj topic using a

PowerPoint presentation because it's easier that way. Students can see (the mosque) and we don't have to explain extensively...however, if we want to teach about the understanding of verses in the al-Quran, we don't have to teach using PowerPoint, we just discuss it in the classroom".

Another teacher (T2) worried about incorrect information on the Internet that could cause harm to "Aqidah" (creeds or beliefs): "We feel worried for Islamic Education. Too many wrongful thoughts on the Internet. Anybody can put up the information and some of them are very dangerous. Other subjects do not involve "Aqidah" (creeds or beliefs). We must ensure that the content of any materials which are accessed is not in any way corrupted. Students must have the mind strength and deep understanding before we allow them to search the Internet themselves".

One teacher (T4) described the "Aqidah" topic as an "abstract" topic that makes it difficult to teach using computers. One student (S4) said that "Aqidah" involved "theory" and "deep understanding" that may require teachers to teach about it. However, one of the teachers (S5) was more positive and receptive to the idea of teaching Islamic belief using computers.

One of the teachers (T1) raised her concern about the need to learn directly from the Islamic Education teachers. According to her, to understand Islamic Education, one must learn from teachers. Teachers were a "must" according to her especially when involving the topic of "jurisprudence". She said that students will understand differently if they read the "jurisprudence" topic by themselves and they need to refer back to their teachers. She said that information on the Internet was "too general" and difficult to teach Islamic Education using that information.

One teacher (T2) argued that Islamic Education in Malaysia is following the "Syafie" school of thought (one branch of Islamic jurisprudence) and it is difficult for students to differentiate between "Syafie" opinions and other opinions. He said "Students learn without following any school of thought. We must think about it ... according to our syllabus, we must follow the "Syafie" school of thought, that's clearly stated in the Acts of Education".

According to this teacher, the fact that the Internet provides vast amounts of knowledge from different Islamic schools of thought can be complicated even for the Form Five students (17 year old). He suggested that Islamic Education teachers identified and marked suitable websites to explore and explained to the students the foundations and basic principles because for him the Internet provides "information" but not "knowledge".

7.8 The Needs for Islamic Education Software

All teachers agreed that they need Islamic Educational software for teaching and learning in Smart Schools and there is no software provided by the Ministry of Education for Islamic Education in Smart Schools. Teachers are using Islamic Education software from private companies. They have bought the software using funds which their school had allocated for Islamic Education.

One teacher (T6) said that, in his school, funding was not a problem in terms of buying educational software since they had been allocated a sum of money which had to be spent every year and which was based on the number of Islamic Education students they taught. "I think this is very interesting (Islamic Education software). We don't have financial problems (to buy it), this year alone we have been allocated RM3000 for Islamic Education...based on the amount of money allocated for each student, depending on how many students we have, about RM3 or RM4 for each student per year. Probably next year this amount will be increased".

According to one teacher (T5), this fund is managed by the Head of Islamic Education in the school and a sum of money had been spent on buying software: "A lot of software was bought by schools for Form 1 and Form 2 students. For the past three years, our school has bought software about prayer and Hajj from the Pilgrims Fund Board (Government of Malaysia). It's up to the Head of Islamic Education to buy it, we don't have to buy it every year". However not all of the schools spent the money on software and one teacher (T1) said that there was no software bought for Islamic Education in her school.

One teacher (T6) stated that it is difficult for them to get appropriate software, as there is a lack of learning resources available in the market: "We depend on the salesmen who come to our school. The problem is about the resource. The resources are not available. They (the salesman) come to sell things like Hajj and Prayer Guidelines which we already have. None of the software is interactive".

Another teacher (T2) agreed with this problem and said, "Not much Islamic Education software is available. If there is any, it's not interactive. I bought some of them but not many because it's not interesting. I only bought a copy of Arabic learning software". All teachers emphasized the need to have interactive multimedia software and declared that the current learning resources available in the market were not meeting these needs. The current resources available on CD or VCD format lack the multimedia interaction which might attract the interest of teachers and students alike.

The lack of appropriate software on the market has made teachers turn to other alternatives. Three of the teachers said that they used to use their own PowerPoint presentation in their classroom. The advantage of using PowerPoint according to one teacher (T2) is, "the content has been summarized, easy for the students to write down the facts, nice graphics and at the end of the presentation, we have the assessment. It is easy for the students also to take notes".

One teacher (T5) said that he taught one of the Islamic Jurisprudence topics, Hajj, using PowerPoint which he claimed was more effective and faster than simple lecturing. Another teacher (T2) also agreed that using PowerPoint helped the teachers to deliver the lessons faster and quicker: "But we can finish the lesson quicker if we teach using PowerPoint. In one period of time we can deliver 4 topics"

7.9 Software Compatible with the Syllabus

All of the teachers agreed that the software should be compatible with the current syllabus in the Smart Schools. When asked about what is the most important characteristic of a software package for learning in Smart Schools, one teacher (T3) replied: "Well-suited with the syllabus, all the input is there, for instance if we want to find all Hadith (Prophetic sayings and practices) for Form 5 then we can get it. It's easier, especially things that we really use it in daily teaching. Another example is Adab (value). It must be compatible with all Adab included in the syllabus".

Another teacher (T1) said that the software should also focus on both the syllabus and the examination as well: "We need software that is really based on the syllabus and for an SPM (Malaysian Certificate of Education) subject like Tilawah (Quranic reading and understanding). We need something for the students to explore and even something special to accommodate the outstanding students". These teachers also stressed the special needs of outstanding students in Smart Schools, for example the need for more challenging activities in the software. As one student (S4) said: "the activities should be more difficult, and a tougher assessment, no need to do it if it's too easy".

The needs of the teachers toward software compatible with the Islamic Education syllabus in school arose from the teachers' concern over the current Islamic Educational software in the market. The software provided by the Ministry of Education for Smart Schools, despite many criticisms, is better in this matter.

The software was purposely built to serve the interest of Malaysian's educational curriculum. However, teacher (T3) said: "The software is not enough. We have only general topics for Islamic Education subject. Unlike Sciences subjects, the software is more focused on the syllabus and easier to find. Let us say, if we want to teach for tomorrow, what we need only do is to open the software and everything is ready, the activities and exercises. We only need to print it out. It's made our life easier, no need to find other resources".

One teacher (T4) pointed out that the software must follow the textbook to stress the importance of having software compatible with the syllabus. Another student also gave her opinion that the future Islamic Education software should provide more information and knowledge for the students, to match to the textbook in terms of the content. However, according to one student (S4) the software should be developed in an interesting and attractive way without too many texts as in the textbook: "More input, comprehensive as the textbook ... but more interesting and exciting, not full of text. The present software provided by Smart Schools is okay, but we need more information and input. For example the Modern Mathematics software is okay".

Unlike the findings of the preliminary study of this research, there were more credits and praises given to Smart School software at this stage of the study. Another student (S5) also agreed that the latest version of Smart School software was better that the first version: "We can say that the software is better than before. The previous software was too full with text which made it more or less like a book"

One teacher (T5) also agreed that the first version of the Smart School software was not as good as the second version: "Take for example the software for Mathematics and Sciences, when it first came out it was terrible, useless. But after that, the second one, it's OK. Now teachers have said it's OK".

One of the Islamic Education teachers (T5) had asked the Ministry to provide software to enhance the use of present educational software in Smart Schools. He said: "If we want to ask teachers to use the software frequently, the Ministry should provide the software. We are not experts to develop the software, not all of us can do it, and if we do, it will not be comprehensive".

7.10 The Subject Content of the Software

In this study, the teachers suggested the topics in Islamic Education that they thought could be effectively covered by software. Ibadah (rituals) was discussed several times by six of the respondents (T2, T4, T5, T6, S3 and S4). One of the teachers (T5) said that he preferred to teach using computers when it comes to the topic of Islamic Jurisprudence: "I teach the Hajj (Pilgrim) topic and other Fiqh topics (Islamic Jurisprudence) using PowerPoint. It's quicker. Students can see (the visual) in front of them. There is no need to talk too much and indulge in extensive elaboration. Tawaf (circling of Kaabah: the sacred structure in Mecca) and Hajj (pilgrim) are really suitable to teach by software. The picture of Masjid al-Haram (the sacred mosque in Mecca), what's it looks like, where to go, where to kiss (the sacred rock) and where to raise your hands, is really helpful".

The use of images and illustration in the topic like Hajj is very appealing according to one teacher (T6). Topics that involve practical rituals are easier to understand using observation. According to the teacher (T6), the students are more focused and appreciated the graphics and images shown in this topic: "For the topic like Hajj, Tawaf and Sa'ie (running between two hill rocks) we can show them the reality of the place so that they can visualize". Two of the students (S3 and S4) agreed that illustrations and images of Mecca and Hajj rituals made them easier to comprehend the lessons Student (S4) said: "Student can imagine and comprehend by visualizing in their mind".

Another topic in Islamic Education mentioned by the respondents was "Tilawah al-Quran" which emphasized on developing skills to read the Holy Book in Arabic script and memorizing selected verses from the Holy Book. One teacher (T2) said that his school emphasized on al-Quran recitation and Tajwid (the science and arts of pronunciation of Arabic letters). Thus, he hopes the software will provide the explanations of Tajwid rules for each verse recited by the students.

Two teachers (T3 and T6) suggested that each Tajwid rules should be "labelled" and "coloured" in different way, therefore it can be easily recognized by the students. Another student (S3) said that for him the most important thing in the software was "good recitation with Tarannum (the arts of reading al-Quran with melodious song) and hearing with clear sound. The audio system must be in excellent conditions".

One teacher (T4) explained that the challenge for his students is to memorize the Holy Book in Arabic: "Really difficult. They prefer skills and activities like gardening. They can't memorize it. If we asked them to memorize "Kulillahumma", they see the verse but they know nothing about it. They repeat the verses many times but they memorize only a few. They remember the beginning and forget the end. Perhaps, they are not too bright also".

However, one of the students (S4) suggested that for memorization purposes it is easier and more practical to use a copy of Holy Book instead of using a computer: "No need to use computer. It's better to use the book or paper to memorize the verses. It's difficult to memorize through the computer because we have to carry the computer everywhere we go"

Two respondents (T4 and S4) said that at least one topic should not be tackled using software and computers. This is Aqidah (creeds or beliefs). One teacher (T4) gave his opinion based on the nature of the topic that it is too abstract to be explained using computers: "Aqidah is about the principle of beliefs. It's very complicated and difficult. It's abstract. As for the Form 4 and 5 students, they learn about deviant groups according to Islamic belief."

Another teacher (T6) said that even though it is possible to teach Aqidah using software and computers, some issues related to other beliefs should be carefully addressed in the software: "It is possible to teach Aqidah using software for example on the topic of heresy, we cannot worship objects like idols. However, we must be very careful and more sensitive in addressing this issue because it may be it's right for us but not for others. I have changed some of my student's works from idol images to tree images". By doing so, this teacher avoids the sensitivity of others because each idol could be associated with another religion.

7.11 The Characteristics of the Software

All respondents claimed it was easier to learn from visual displays such as pictures, images and graphics. Learning incorporates visual displays such as visual objects, animations, models, mind maps and diagrams. All of these are important and very attractive for the students. One student (S1) said that he enjoyed images and animation on the Internet and another student (S4) said that she wished to observe real life objects and events in learning even though it was only computer visual: "There is too much theory and just a few practical aspects in classroom. It's only memorizing. Maybe for Biology and Chemistry it's ok. We can't imagine the real life. For me, I prefer the real life, even though only in visual."

Two teachers (T5 and T6) agreed that the students more easily understand certain topics in Islamic Education by watching and looking at the images and events. One teacher (T6) said: "The aim of using a CD is to make it easier for the students. For example, the images shown are easier for the students to remember compared to the lecture given. Take another example, Hajj. It's easy to lecture but the most important thing is that students like what they see, to visualize and to sense it. That's what they like most".

Another student (S2) also agreed that the use of images and pictures make a difference in teaching and learning Islamic Education and that the experience is different if the lessons are delivered using virtual displays: "It's not same if it is only delivered by talk. I love colourful images with good sounds". One teacher (T3) had pointed out that using different colours could help the students to identify different concepts and rules to avoid mistakes: "Differentiate the rules of Tajwid and Arabic characters using different colours...by using different colours we are more confident because sometimes we are uncertain. If we have things like this it will more sophisticated".

One teacher (T6) pointed out that the students learn best through images and visualization where the students are able to retain and recall the information through mental images in their minds. This teacher argued that visual learning is more effective in certain topics compared to teacher-centred learning which concentrates on lecturing and one-way communication. He argued that students can easily lose their attention and concentration when the lessons are delivered only by talking: "The students will understand less if we are only talking in the classroom. Take the Hajj topic for example. It's too much talk and the students lose their attention. The students are not interested in lectures. They like to see something like images so that they can imagine what it looks like, like watching a movie film where they can recall and tell the story" (T6).

The capability of software and computers to project learning activities using modelling and simulation was really appreciated by the respondents. According to one student (S4) the virtual reality simulations designed by a computer enable learners by more direct exposure to understand tasks which are difficult to do in reality: "Using visual we can understand more. We can visualize how to slaughter animals according to Islamic rules ... Not all of us can afford to slaughter animals as sacrifices to God, and not many of us can afford to go to Mecca for Hajj".

The experience of virtual reality remained in the mind of the students for a long time: "We can remember what we have gone through, what we have seen and what we have done. Reading also can helps but is easier to forget. It's better if we can imagine and visualize. Islamic jurisprudence, worship ritual and Hajj, the more graphics and images are provided the better. All this can be done through software" (S4).

Another teacher (T6) also suggested the use of modelling in Islamic Education teaching. Using a model followed by an explanation will make the teaching easier to understand for the students: "The use of a model coupled with explanation from the literature will make it easier for the students to understand. The use of water and stones to purify impurities can be explained by showing them the images. It's clearer"

One student (S5) said that students are more attracted to activities that can meet their needs such as making diagrams to illustrate something: "By using diagrams and charts we can do anything. Students need something that can satisfy their needs". Another student (S1) suggested the use of mind maps which he claimed will help students to learn and memorize the relationships between key elements of information: "There must be interesting activities in the software. The mind maps should be in there, making it easier for the students to remember the relationship. If possible, put in some animation but I think the mind map is enough".

Other learning activities suggested by the students were games and play activities. The respondents (S2, S3 and S4) enjoyed playing games even though there were differences in terms of the types of games they preferred. Student (S2) enjoyed playing adventures and shooting games like "PS war games". He felt that this type of game can be used in some Islamic Education topics. Student (S3) preferred the football game but he claimed that it is difficult to apply games into Islamic Education lessons unlike Mathematics and Sciences subjects.

Another student (S4) said that games and plays in the form of maze games like "crosswords and puzzles" were preferred by both boys and girls. The games which the students preferred and said kept their attention were those which offer different levels of challenges and multiple levels of ability so that they can make progress. As one student (S4) pointed out: "they are more challenging and responsive to our ability", and another student (S2) said: "We can challenge other friends and see who gets the highest points".

7.12 Summary

This chapter presents the in-depth interview data. The in-depth interview sessions provided good opportunities to probe further the issues raised from the focus groups and the survey study. There were eleven issues raised and identified in these interviews. Most of the findings highlighted in this chapter reinforced the findings from the previously presented data, however some of them do not support the previous findings.

The access to computer labs and the availability of computers and projectors remain problematic in Smart Schools. An examination-orientated system is a major barrier to incorporating ICT in classrooms and this remains a contentious issue among teachers. The findings also suggest that the level of computer use was still very low among both Islamic Education teachers and students alike.

Chapter 8 Discussion of Findings

8.1 The Views and Attitudes of Islamic Education Students and Teachers toward the Use of Computers and ICT in Smart Schools

This study is seeking to understand the views of Islamic Education teachers and students regarding the use of computers and ICT in their schools, and how the use of computers and ICT in their schools has affected teaching and learning activities in classrooms.

8.1.1 Views toward the Emergence and the Use of Computers and ICT in Smart Schools

The need to use computers and ICT in Smart Schools has been an important and driving factor in the Smart Schools initiative in the eyes of Islamic Education teachers and students. According to them, the use of computers and ICT in Smart Schools has affected their work and studies in Smart Schools. They claimed that the current changes in Smart Schools and the need to use computers and ICT, in some degrees, has affected their classroom activities. They also agreed that the Government is planning to implement Smart Schools nationwide in the coming years. This is not a surprise since the Malaysian Government thinks ICT can be used as a leaping frog for the nation's progress in the next decades.

The literature shows that since the beginning of the official launching of Multimedia Super Corridor (MSC) by the Malaysian Prime Minister in July 1997. it is very clear that the objectives are to capitalise on the leading edge of ICT technology to achieve the status of a developed country by the year 2020. The launch of the Smart Schools Blueprint in the same year as one of MSC flagships was very important to steering the national economy towards a knowledge-based economy (Chan 2002). The Smart Schools objective is to re-invent the teaching and learning process with the aid of ICT technology (MMoE 1997a; MMoE 1997b; Bajunid 2000; Chan 2002; MMoE 2004).

This policy introduced by the Malaysian Government is following and reflecting the trend of Governments throughout the 1990s to launch new policies in ICT, to enhance national educational initiatives like "Technology Literacy Challenge" in the United States of America, "National Grid for Learning" in the United Kingdom, "ICT Masterplan" in Singapore and "Special Administrative Region" in Hong Kong (PCAST 1997; Selwyn 2001; Yuen 2003).

The Islamic Education teachers and students in this study agree that the current educational change in Smart Schools is closely associated with "technology changes" around their schools. Findings from focus groups clearly indicate that the changes occurring in Smart Schools are positively related to the emergence of new technology in ICT and the use of computers in Smart Schools. The introduction of the Smart Schools Management System (SMSS) which imposed on all teachers in Smart Schools to log-in their attendance, manage students' affairs and plan lessons using computers has forced Islamic Education teachers to master the new technology.

Meanwhile, the Smart Schools Management System (SMSS) is very important for the students in this study to get connected to the Internet and have access to email. The students also reported that sometimes they use the Smart Schools Management System (SMSS) to practise their learning activities.

As a result of the need to use computers and ICT in Smart Schools, the survey found that the majority of Islamic Education teachers (98%) and students (93%) agree that the mastery of new technology is very essential for their work in Smart Schools. They said it also important for their future studies and careers.

The Islamic Education teachers mentioned the importance of computers and ICT for their work in the future even though they are not frequently using it at present. The latest literature shows that many teachers who were sceptical about ICT contribution in learning are now becoming convinced of the importance and benefit of computers and ICT in the classroom (Prior 2004; Tearle 2004).

Throughout this study, I have found that the attitudes of Islamic Education teachers and students are very positive towards the current change in Smart Schools. From the beginning of the focus group study, the participants were very receptive toward the Smart School initiative. The participants have welcomed this new ICT policy which is in line with global trends. The survey data also shows that their attitudes are very positive and very warm towards the Smart

School initiative. 94% of the teachers and 91% of the students agree that this initiative was really needed. More than 85% of the respondents believe it has been useful for them, very interesting and enthusing.

Despite this, the study has found that the participants are not very pleased with the implementation of the initiative. The lack of computers and training were among the significant problems raised by the teachers in the implementation of the Smart Schools initiative. These problems will be discussed in the next section (8.2: Barriers in the Implementation of Technology Use in Smart Schools).

This study has also found that a great deal of emphasis was put on hardware and software rather than training and staff development. Reports from the respondents show that a large number of new computers, new computers labs, new cyber cafés, new LCDs and new OHPs in the classrooms appeared in Smart Schools. The literature (Chan 2002; MMoE 2003; MMoE 2004) also shows that much of the Smart Schools' funding was allocated for the development of hardware and software such as the Smart Schools Integrated Solution (SSIS).

Too little effort was spent on educating teachers in technology, while a great deal of effort was spent on funding hardware and software in Smart Schools. Reports on ICT in the past have indicated the same problem and the urgent need to strike a balance between the development of hardware and the development of teachers' skills and knowledge (Fullan 1992; Cuban 1993; Budin 1999). Many researchers (Farrell 2000; Cuban 2001; Selwyn 2001; Robertson 2003) have been arguing the rationale of such large funding in ICT infrastructure and doubt the returns of such huge investment in the teaching and learning process in the classroom.

The findings show that ICT is very popular among the participants. 91% of the Islamic Education students and 98% of their teachers said they enjoy using computers. Most of the participants (88% of the teachers and 87% of the students) believe this new initiative has given them a chance to obtain some training in computer literacy. The students believe that the use of ICT in schools reflects the good status of their schools and being selected as a Smart School is perceived as an advantage and has been described by students as "sophisticated and up-to-date".

Perhaps this finding is not as strange as might be expected. It is important to note that Smart Schools are not typical Malaysian schools. First, they are schools which have been specifically set up by the Ministry of Education to support educational reform using computer technology. Second, they have significantly more technology equipment per-capita than the average school in Malaysia. Third, they are in excellent condition to support curricular and pedagogical change in the classrooms.

Despite this, what was not expected from the findings was the low level of computer use in the teaching and learning of Islamic Education despite a significant investment of ICT resources in Smart Schools and the strength of interest of Islamic Education teachers in ICT. The Islamic Education teachers in this study have admitted that computers are rarely used in their classrooms even though they have recognized the importance of ICT and the popularity of computer use among their Smart School students.

These Islamic Education teachers and students maintain that time constraints and examination-centred learning are among the obstacles that have forced them away from using computers in the classroom. One teacher said: "Our education system is based on examination and our examinations are based on textbooks. At the end of the day people only look at the examination results". The obligation to perform well in the exams and achieve excellent results as demanded by schools and parents has made the teachers and the students very conscious in their teaching and learning activities. They had to choose the appropriate means to ensure their objectives can be achieved.

The students are convinced that computers do not help them in the examination. They rely more on teachers to help them achieve an excellent result. More than one student said that teachers remain the main source for learning. The computer is just a tool and an additional source for learning. As one student said: "It's just a tool and a medium for learning". This shows that the students do not accept ICT and computer literacy as a goal in itself but only as a tool and means to motivate learning in the classroom.

The Islamic Education teachers in this study are even more convinced about using national textbooks as their primary means of teaching and the most important tool in their kitbag. The obligation to deliver the national syllabus in a tight period of time according to school standards has forced them to resort to the use of textbooks in the classroom, in the belief that they can deliver the syllabus "quickly and faster". These teachers believe the current technology provided by the Ministry of Education and the software available on the market is not sufficient to help them to cover the whole syllabus.

One teacher stated clearly that the main goal of a school is to strive in examination and not to teach computer literacy. He said: "Our main goal is excellence in academic studies, and this excellence can only be proven by excellent examination results. We are not here to prepare students with computer literacy. If that is the case, I think we have already achieved it because nowadays all students are computer literate which they have acquired by themselves".

The implication of this attitude is that even though Islamic Education teachers and students agree that the computer is useful as an additional resource in learning, they believe its potential is very limited in achieving the main goal for a school which is an excellence in academic study. Another consequence of this is it is not difficult to understand why the main use of computers by Islamic Education teachers and students in this study is limited to administration tasks, clerical work, and to other activities, rather than in teaching and learning activities in the classroom.

There is no evidence in this study which shows that these teachers and students oppose the use of ICT and computers in Smart Schools. In fact, the survey shows a very high percentage of Islamic Education teachers and students support the use of computers in Islamic Education. This finding is consistent with other research. It has found little evidence of technology resistance like cyber phobia or technophobia and towards the use of ICT and computers in schools (Cuban 2001a; Conlon 2003). Watson (2006) said that very rarely teachers oppose planned change by policy makers. Instead, they are very receptive and always welcome innovation. Teachers will resist innovation only when it fails to identify the difficulties and liabilities faced by them in the implementation process and the failure to establish mechanisms to uncover barriers and to lift them.

Much research (Cuban 2001a; Hayward 2002) shows that many teachers and students are serious and keen users of computers and spend more time on computer outside the classroom. There must be an explanation why those who have been identified as serious and keen user of computers outside classrooms, are reluctant to use them in the classroom. In this study, the reasons behind their reluctance to use computers in the classroom seems hugely related to external factors such as computer availability rather than internal factors such as teacher attitudes or the individual problems explained in detail in section 8.2: Barriers in the Implementation of Technology Use in Smart Schools. Other than this, no evidence has been found that Islamic Education teachers and students resist the use of the computer in teaching and learning Islamic Education in Smart Schools.

8.1.2 Views toward the Emergence of New Teaching and Learning Initiatives

The blueprint of Smart Schools indicates that the Smart Schools are not only about new technology and computers. In fact, the Smart School conceptual framework shows the desire to revamp the whole educational system in schools from the core business of teaching and learning to school management with the help of new technology:

> "The Malaysian Smart School is a learning institution that has been systemically reinvented in terms of teaching-learning practices and school management in order to prepare children for the Information Age. A Smart School will evolve over time, continuously developing its professional staff, its educational resources, and its administrative capabilities. This will allow the school to adapt to changing conditions, while continuing to prepare students for life in the Information Age. To function effectively, the Smart School will require appropriately skilled staff, and well-designed supporting processes."
>
> (Malaysia 1997a)

Based on the students' experiences in this study, I have found that there have been some changes in learning activities for some subjects such as Malay, English, Biology and Physics. Students report that their teachers are using various activities to enhance ICT in teaching and learning. Teachers have been reported as using the Internet to learn other languages, download materials and videos from the websites and use PowerPoint software to present their teaching materials. However, little evidence exists to show that teachers have been using software provided by the Ministry of Education.

This study has found that only one out of fifteen Islamic Education teachers interviewed has used computers extensively in teaching. The rest of the teachers either use computers occasionally or not at all in their classroom. Islamic Education teachers still heavily rely on familiar traditional teaching methods including lectures, discussions, assignments and homework. Teacher-centred classroom activities are the norm in this subject according to the students. This finding is consistent with the reports in the literature that ICT is not well integrated in the classrooms yet (Cuban 1993; Farrell 2000; Mumtaz 2000; Cuban 2001a). Cuban (2001a) said that only one tenth of the teachers are serious users who use computers every day whereas one half of the teachers are non-users and the rest are occasional users.

Findings concerning the Islamic Education teachers' data reveal that little has changed regarding technology use in teaching and learning Islamic Education over the past 3 years of the Smart School initiative. The evidence shows very little IT integration into the teaching of Islamic Education even though there has been some indication that Islamic Education teachers are starting to consider taking on a new role in the classroom. Nevertheless, classroom activities for this subject in Smart Schools are far from being significantly influenced by the use of ICT.

The teachers in the survey say that they need more training and resources to illustrate how to incorporate ICT based activities that can interest, challenge and actively engage students in their classroom. The extensive and dramatic increase in ICT resources and infrastructure in Smart Schools does not necessarily reflect the actual implementation of computer and technology use in classrooms. Indeed, to pursue the goal of greater use of computers in Islamic Education is not solely dependent on the technology available. The most important influence is the skills and capability of Islamic Education teachers to integrate computers and technology into the classroom. Much literature shows the teachers' need for training in the pedagogical use of ICT in the classroom (BECTA 2004; Barton 2006)

A dilemma appears to exist for Islamic Education teachers between the desire to use ICT effectively, and a concern about what are the best ways ICT can be applied in this subject. It seems that the contents of some topic culture in Islamic Education is not compatible with the claim that ICT can enhance teaching and is a useful tool for increasing understanding and productivity in learning. In the words of more than one teacher: "Not all of the topics can be taught using ICT. It depends on the nature of the topics taught".

In some topics in this subject, like Tafsir al-Quran and Aqidah, most of the teachers believe that the traditional teaching practice is far more effective. In this case, Islamic Education teachers are united to protect the core values and elements in their traditional teaching practice. Research in literacy learning also found no evidence to support that ICT method of instruction is superior to the traditional teaching practice and in fact teachers' beliefs and practices are more significant and important in mediating learning than the technology by itself (Andrews 2004).

This study has found that Islamic Education teachers are very keen on emphasizing the need for the students to learn first-hand from them, as they believe some topics in Islamic Education are very difficult to understand by personal study. Islamic Education teachers are seriously concerned that their students will misunderstand the principal beliefs of Islam.

8.2 Barriers in the Implementation of Technology Use in Smart Schools

8.2.1 Lack of Computer Access

There are many reasons behind the lack of access to computers in the schools as reported in much research (Hodas 1993; Murphy 1998; Mumtaz 2000: Owston 2001; Cuban 2001a; Ainley 2002; Condie 2002; Cuckle 2002; Zhao 2002; Robertson 2003; Tearle 2003; Sutherland 2004; Kompf 2005). Research shows that a supportive school environment and easy access to technology are very important in ensuring successful technology integration. A lack of computer availability in schools is able to prevent the frequent use of technology in schools.

Research has also found that computer labs can seriously limit teachers' access to the computer. Indeed, some researchers even believe that having just a few computers within the classroom is more effective for learning than having computer labs far away from the classroom. Zhao (2002) argued that there are major differences between access and easy access. Perhaps schools may have many computers in labs but this does not mean teachers have easy access. Teachers may not enjoy regular access to the computer labs because of their distance from the classroom and tight scheduled lab time.

Obviously, in this study, accessibility to computers has been problematic for Islamic Education teachers. The present policy in Smart Schools to have dedicated computer labs seems to be an important issue which may have contributed towards the lack of access for Islamic Education teachers to the computers in their Smart Schools. They complain that computer labs are not only too far away from the classrooms but may need to be booked far in advance.

The small number of labs and the high demand to use them has created "clashes of timetable and problems to find suitable time for everyone". The issue of priority in using computer labs also contributes towards the lack of motivation for Islamic Education teachers to use the labs. Many Islamic Education teachers in this study believe that computer labs in Smart Schools were created for Smart subjects and that is why their teachers are accorded priority of use. Therefore, Islamic Education teachers have become very reserved and hold back from using the labs. This problem clearly has a huge impact in curbing their aspirations to use ICT in their teaching.

In this study, I have found that Islamic Education teachers rarely use computers despite their enthusiasm for them. The data shows a very high percentage of Islamic Education teachers never use educational software (46%) or the Internet (33%) in Smart Schools. However, a majority of them has shown a very positive attitude toward computer use in Smart Schools and 92% of them are convinced that computers can be integrated successfully in teaching Islamic studies.

This finding sharply contrast with the finding of Mumtaz (2000) and BECTA (2004) that shows little enthusiasm and little interest of teachers in using computers in schools. In this study, however, other factors like the limited number of computers and restriction on using computer labs are among the major factors discovered as discouraging Islamic Education teachers from greater access to the computer.

Benchmarking research (MMoE 2004) on Smart School initiatives shows that the ratio of computer: students was 1:26 students per computer in secondary schools and 1:43 in primary schools. This ratio is still lower than that achieved in developed countries like 1 to 3 students in US and Australia (OECD 2006:1), and 1 to 3.7 students in the UK (BECTA 2006b:20). However, the launch of the Smart School initiative has undoubtedly improved the ratio of computers to students in both primary and secondary schools.

Nevertheless, the Islamic Education teachers in this study hold the view that there are still insufficient numbers of computers available to them. They demand more computers available in schools if the Ministry of Education wants them to continue trying incorporate ICT into their work. The limited number of computers has seriously affected their enthusiasm for preparing lessons using computers. As a consequence, they have resorted to the conventional methods of teaching such as giving lectures and using existing technology aids such as the Over-Head Projector (OHP).

According to the students, even in the Smart subjects like Maths where there was more attention given by the Ministry of Education and well established ICT applications, the use of computers was very low. Even though these subjects are not part of this research, it has not prevented the question of accessibility of computers in Smart Schools being raised by the students.

8.2.2 Lack of Reliable Resources and Software

Based on literatures (Chan 2002; MMoE 2003; MMoE 2003; MMoE 2004), this study has found that the software developed for Smart Schools was mainly developed by the Telekom Smart Schools Company (TSS). There have been two new technology innovations mentioned by the participants in this study, first; the Smart Schools Management System (SMSS) as the core technology and a heart of Smart School initiative and second, the Teaching and Learning Materials (TLM) in the form of subject software. The Telekom Smart Schools Company (TSS) has produced 1,494 volumes of software for 4 Smart subjects namely Malay, English, Mathematics and Science (MMoE 2003:11).

It is clear that this technology initiative has relied upon technocrats and policymakers to communicate its value to teachers, instead of involving teachers from the start. The Islamic Education teachers in this study claim that only brief information was given in the beginning of Smart Schools and there has been a lack of training in Smart Schools in general and the new technology use in particular.

This study found that like any other innovation, SMSS and TLM have also faced problems. One of the Islamic Education teachers said that the SMSS developed by Telekon Smart Schools is very "complicated" and not "user friendly". It is difficult to use even for the technology literate. As for TLM, the students said they are reluctant to use the software provided because some of it is "too easy" and "childish". The software provided was sub-standard and not suitable for high achievement students in boarding schools. This has created a very difficult situation for the teachers because they have to be very selective to ensure the software is suitable for their students' ability.

Software development such as SMSS and TLM should involve teachers and students from the beginning, rather than just imposing a requirement to use ICT on them in the classroom. It is very beneficial to involve teachers from the beginning to ensure the software is integrated well with their needs. It is also important to take into account the views of students as they are the primary users of this software. This will help to increase teachers' competency in technology and the students will benefit from content acquisition from the software.

The participants in this study agree that it is also useful for them to have proper training to help them to incorporate innovations confidently into the classroom. This training should be able to encourage them to find their own ways to integrate computers in their teaching. Zhou (2002) found a serious problem in the current effort to prepare teachers to integrate software in their teaching where training only consisted of motivational speeches on how to use a piece of software without paying much attention to pedagogical aspects and establishing links with the curriculum. To integrate software in teaching, teachers need well-prepared instruction to ensure a particular item of software can be implemented in the classroom. In order to do so, teachers need training and resources that help them to illustrate how to integrate this software into their teaching.

Even though the teachers in this study were not provided with subject software to use and were not required to use the software, they were encouraged to incorporate ICT in their teaching. They also had to use SSMS in their daily work as classroom teachers to update students' progress and classroom management. From the interview data, it is clear that only two Islamic Education teachers made a serious effort to incorporate ICT into their classroom. One teacher took it upon himself to create an interesting PowerPoint presentation about the "Hajj" and another teacher constructed lesson content from a range of websites, carefully choosing a pedagogical approach to achieve her objectives. However, both of these teachers said that they had not had any proper training in ICT and had to rely on colleagues to help them working with the new technology.

The remaining Islamic Education teachers have rarely used ICT in their classroom and continue with their existing practices. For these teachers, their approach remained uninfluenced by ICT tools and software. They also mentioned the lack of software available for Islamic Education as one of the reasons behind their reluctance to use computers. Other teachers said that the software bought by their school from a private company is too general in content and does not help them to deliver the national syllabus. Much of the literature shows that the lack of availability of suitable software has limited usage in the classroom (Mumtaz 2000; Cuban 2001a; BECTA 2004).

Research by Orrill (2001; 2004) are good examples to show how crucial is teachers' involvement to ensure a successful software integration into the classroom. Literature shows that teachers, using their own creativity, are able to create better ways to integrate software in the classroom with the help of software developers and researchers.

By using a combination of teachers' expertise and need, Orrill was able to identify proximal goals which are small and easily targeted goals that help learners to move toward a larger goal in learning. Orrill (2001:14) said: "I found it effective to focus the teachers' attention on improving student learning. Once each teacher identified the areas where she wanted to see student improvement, we were able to generate proximal goals for getting there using reflective questions that led to the development of a framework for developing proximal goals".

Literatures show that ICT tools and software use in the classroom is best created and incorporated by the teachers themselves as they are the experts on subject matters. Islamic Education teachers in this study agree that not all of the topics taught in this subject are best delivered by ICT tools and software. One of them said that some topics are even better delivered by the traditional approach. In this study some teachers displayed their creativity to choose the ICT tools and software to support their teaching. A combination of the subject's nature, a pedagogical approach and appropriate ICT tools and software with the individual's interest and collective activity is deemed of great importance to integrate ICT in Islamic Education teaching.

The literature also shows that it is important to understand the subject culture in order to integrate innovation and software in the classroom. Research has found that teachers can successfully integrate software in teaching their subject when they can use it to transform their own knowledge on the subject area and adjust their teaching practices to suit the new innovation (Lee 1997; Ainley 2002; Zhao 2002; Goodison 2003; Sutherland 2004). Sutherland (2004) found how a teacher using his creativity successfully used a dynamic software package to show the effects of a negative scale factor that students would normally find difficult to see.

It is important to seek teachers' and students' opinions to determine what might be suitable for them before developing any software and then to test it in the classroom. It is not wise to presume and treat ICT tools as unproblematic change that will lead to enhanced learning in schools and therefore replace older technologies. More importantly, the teachers and the students should also engage in discussions about the relative merits of different tools and their usage, so that they can become resourceful learners. Knowing how to use tools to transform learning in schools is not necessarily straightforward. However, this study found that two of the Islamic Education teachers are able to develop ways of embedding ICT into their teaching such as developing websites and using PowerPoint software. And that is a good starting point.

8.2.3 Negative Attitudes toward Computer Use: Fear of Distraction

Much literature shows that one of the big obstacles to integrating technology in the classroom is teacher resistance and unwillingness to change. Many studies have found that teachers resist using technology because of a fear that their authority and expertise is at stake when they need to be coached and thus shown up by their students on how to use the computer (Hodas 1993; BECTA 2004). Teachers are indeed struggling to retain mastery over the students and this explains why they fear and resist the use of technology. They feel strong pressures on them to master new technology skills in the classroom and fear having difficulties with complicated technology at the front of the classroom (Hodas 1993; Mumtaz 2000; BECTA 2004).

However, there is little literature reporting students' fear of technology and the reasons why they are unwilling to use computers in learning. In this study, I found that students had resisted using computers because of their fear that computers could distract them from learning. They said they were afraid to use computers because of "too many distractions" that allowed them to deviate their intention from research for their subject on to something which was quite unrelated with learning such as playing games, downloading new songs and lyrics, and surfing unrelated websites in the Internet.

In this study students were very obviously concerned about examination achievement and academic excellence. They said that the examination results are far more important than picking up computer skills. They argued that computer skills can be developed and learned later on and at any time. What they have to focus on are their examinations.

Consequently, students are not bothered if the teachers do not use computers in the classroom as long as they can achieve excellent exam results. In fact, surprisingly, the students believe that the computer does not help them in examinations. They said that no one uses the computer labs prior to examination time. According to the students, computers are less used by those involved in major examinations like PMR (Lower Secondary Examination) and SPM (Malaysian Certificate of Education)

This attitude is also shared by Islamic Education teachers who argue that excellence in examinations is the ultimate goal to aim at in Smart Schools and thus all learning activities should help students to achieve better examination results. These teachers say that it is a matter of fact that the Malaysian education system is more examination-centered and that the authorities and people in general measure success in learning by examination results.

Therefore, all activities that encourage excellent results in examinations should be the priority in teaching and any activities that do not help teachers to build up good results should be abandoned. In this study, not many Islamic Education teachers believe that ICT can enhance academic achievement and help them to cover the national syllabus which is examination based. This belief is shared with some researchers in ICT who also doubt the contribution and achievement of ICT in learning after decades of huge investment (Hodas 1993; Cuban 2001a; Robertson 2002; Selwyn 2003; Andrews 2004; Wellington 2005).

On the other hand, this belief can be sharply contrasted with other findings (DfES 2002; Harrison 2004) which clearly show that ICT is positively associated with improvement in subject-based learning in several areas such as English, Maths, Science, Modern Foreign Languages and Design Technology. Harrison (2004) proved that greater use of ICT in curricular study is strongly associated with improved performance in public examinations and other tests.

Even though none of these research findings prove a direct effect of student attainment in examination using ICT, I have found in this study that this issue has somehow affected the use of computers and technology in the classroom. The participants believe that ICT does not lead to improve exam results, and this might be contributed towards little use of ICT in Islamic Education. Anyway, in no way can this study prove an association between ICT use and student attainment because of very little use of ICT in Islamic Education learning. Indeed, it is impossible to measure how ICT resources can improve student attainment unless they are used regularly and constructively in the classroom (Goodison 2002).

8.3 Needs of Islamic Education Teachers and Students in Smart Schools

8.3.1 More Access to Computer

This study has found that Islamic Education teachers and their students need more access to the computer. The current access is very low and does not satisfy the needs of either the teachers or the students. The students complain regarding the amount of computer access. There are two main obstructions to greater computer access in Smart Schools in this study; firstly, the difficulty of gaining access to a computer lab and secondly, time constraints.

The issue of difficulty in the use of and access to the computer labs in Smart Schools needs to be addressed by the school authorities and should not be taken lightly. The reason behind this difficulty as explained by Islamic Education teachers in this study is the limited number of computer labs available and the fact that they have to be shared with "everybody and every subject". This has forced the schools to implement an advance booking policy which is seen as a restriction and complication by the Islamic Education teachers. Therefore, they and their students said there is an urgent need to increase the number of computers in Smart Schools.

The teachers also maintain that the computer labs are too far away from their classroom and it is difficult to manage 20-30 students going to these labs. It takes time to complete the journey from the classroom to the computer labs and return. Therefore, only classes with longer blocks of time or "double periods" (80 minutes) have the opportunity to make good use of the computer labs. Possibly, there is a need to review the policy of having computer labs and suites. It may be time to re-think the idea of the original plan of Smart Schools of having computers shared by 8-10 students inside the classroom as proposed in the early stage of the Smart Schools blueprint (MMoE 1997b).

There is evidence from the literature which suggests that the effect of teaching and learning using ICT in an ordinary classroom, despite using a small number of computers, is far more effective and encouraging than using computer labs and suites (Budin 1999; Becker 2000; Cuckle 2002; Barton 2006). According to Budin (1999) the original idea of having a computer in an isolated place like labs and suites was based purely on bureaucratic and administration purposes, to tackle the issue of the lack of computers in schools and computer anxiety among teachers, rather than on educational considerations.

The DfES (2006a) reported that Interactive White Boards are used more frequently compared to computers because they are located inside the classrooms with easy of access and ease of integration in the teaching. In contrast, ICT suites and labs are difficult to access and book, difficult to monitor the students' work and very disruptive for pupils who are required from classroom to lab and back.

8.3.2 The Need to be Recognized as a Smart Subject

The Islamic Education teachers and students in this study have a very good attitude towards computers. Their attitude toward computer technology is very positive and supportive. Most of them enjoy using computers and they would like to use them in the classroom. The vast majority of Islamic Education teachers (92%) and students (74%) were convinced that computers can be used successfully in teaching Islamic Education. This is a good sign that the use of computers in this subject has the potential to develop into a Smart subject. The overwhelming support from the teachers and students is crucial in ensuring that Islamic Education will be implemented successfully in the next phase of Smart School roll-out all over Malaysia.

The Islamic Education teachers in this study iterated the importance of Islamic Education being recognized a Smart subject by the Ministry of Education in order to progress the use of ICT in the subject. These teachers believe that the current status of Islamic Education is not helpful and that its recognition as a Smart subject is vital for enhancing the chances of using ICT in their teaching. They also believe that Islamic Education is a non-Smart subject, so that they are not required to use computers in their teaching and if they do then "it is by our own initiative" on an "individual and volunteer basis" without "any obligation". They believe that the current practice does not enhance the use of ICT in their subject, as it is used on a small scale and at the level of the individual and that, consequently "its effect is relatively small".

Islamic Education teachers believe that the lack of ICT resources, software and learning materials in Islamic Education can be solved once Islamic Education is recognized as a Smart subject. The teachers maintain that those who teach Smart subjects are luckier as "they have very detailed and comprehensive software, covering all subject topics and the syllabus, plus guidelines for teaching and learning activities". They believe that such comprehensive teaching and learning material will only materialize if they are provided by an authority like the Ministry of Education. Therefore, they really believe that recognition is a must and important. As one of the teachers said, "Until it becomes a recognized policy, there is nothing much we can do".

Recognition as a Smart subject is essential for Islamic Education from the teachers' point of view. Take for example the issue of priority in using computer labs. Some of the teachers believe that computer labs were created solely for Smart subjects. Consequently they have become very reserved and restrain themselves from using the computer labs. Even though, this is a clear misunderstanding as there are no restrictions on Islamic Education teachers from using computer labs, clearly the idea of having Smart subjects and non-Smart subjects under the roof of one school has created and contributed to the advent of unhelpful attitudes and practices among some of the teachers in this study. Right from the beginning, the school authorities and the administration should have addressed the issue of priority in using computer labs and explained their policies to the teachers to avoid any misunderstanding.

Evidence from the literature shows that recognition and commitment from the school authority is very important to ensure the success of computer integration in schools. Hennessy (2005) found that one school that had enjoyed a specialist status in science and mathematics and been granted considerably ICT equipment, was very extensive in using it. In contrast, English teachers who had not had the luxury of a dedicated computer suite and had to rely on less advanced equipment were frustrated at not being able to improve the scope and quality of their teaching.

8.3.3 Teaching and Learning Materials and Reliable Resources for Islamic Education

In this study, I have found that there is an urgent need to provide Islamic Education with credible software for teaching and learning purposes. I have found that there is a critical lack of appropriate software for Islamic Education. The current software used in the schools was provided by private companies and it is neither compatible with the syllabus nor interactive. The software was created merely from a business point of view rather than to confirm with educational purpose. Some of the materials have their origins in Video Cassette Recorder (VCR) materials and have merely been changed into Compact Disc (CD) format to be able to use on a computer.

The teachers in this study have repeatedly stressed the urgent need for purpose-built software which conforms to the Islamic Education syllabus. The Malaysian educational system is largely based on examination orientation as admitted by Islamic Education teachers and students in this study. Therefore, software should be developed according to this national syllabus because examinations in Malaysia are based on a national syllabus. Islamic Education teachers hope, therefore that the new software will help the students to achieve better results in their examination because "at the end of the day, people will only look at the examination results to determine whether you are successful or not".

The report of ImpaCT2 (DfES 2002; Harrison 2004) shows that a higher level of ICT use can be positively associated with higher examination achievement in schools at each Key Stage studied and the most significant association is in Science in Key Stage 4 where Science teachers have been developing ICT materials longer than any other subject teaches and they know how to capitalize on the potential of ICT. These reports have also stressed that there is a clear alignment and a good correspondence between the content of ICT and the content of the Science syllabus that allows ICT to be more successfully integrated with Science than with other subjects.

The demand of the Islamic Education teachers to have comprehensive software covering the whole syllabus is very difficult to fulfil. Even if the Ministry can create such software there can be no guarantee that it will work perfectly in the classroom. Research shows that the software provided by the Ministry for other subjects like Science, Mathematics, English and Malay was not fully utilized by the teachers (MMoE 2003).

It is perhaps worthwhile to say again that the purpose of having software is not to replace the unique role of a teacher in the first place and not to be viewed as a stand-alone means of delivering the Islamic Education syllabus. The software should be seen as simply another tool to enhance the teaching and learning activities in the classroom and one which can only be successfully integrated into the classroom when it is applied with the clear vision, imagination and creativity of the teachers. Research shows that a piece of software can only integrate well in the classroom with a creative approach by the teachers (Zhao 2002; Goodison 2003; Sutherland 2004).

8.3.4 Training in ICT

The issue of lack of training was obvious among teachers compared to the students. According to the students they had been trained in "computer literacy" classes for two hours every week for the last three years. Meanwhile, their teachers said that they never been trained in computer literacy and were looking forward to attending such courses like other colleagues. One of them said that she had applied for courses and training in ICT every year but had never been accepted. 98% of the teachers and 85% of the students agree that more time is needed to become more proficient in using technology. The interviews showed that Islamic Education teachers want between one and three years to become familiarized with and competent in using ICT.

According to the teachers, Smart subject teachers in Mathematics, Science, English and Malay have had more opportunity to attend training and courses in ICT and new technology. Developed by the Teacher Education Division of the Ministry of Education (MMoE 1999a), these courses were a series of carefully planned courses packages called "Cascade Model" for Smart subject teachers. The Cascade Model started in 1996 with 3 cohorts of selected master trainers from schools to undergo training and later pass on what they had learned to 20 other colleagues from 20 different levels of schools, districts and states (MMoE 1999a; Chan 2002).

However, these courses were confined to the four selected subjects mentioned above and there is now an urgent need to organized similar ICT training for Islamic Education teachers whose knowledge and training in computer programs and Internet resources has mainly come through self-training on Microsoft Word (47%), Internet Use (40%), Email (33%), Online information (30%), Database (26%), Internet Conferencing (18%) and Educational software (13%). Many researchers have asserted that without proper and professional training to develop skills, knowledge and attitudes among teachers, the effort to infuse ICT into the curriculum will not succeed, no matter how sophisticated the technology or the number of computers there are in the classroom (Lee 1997; Cuban 2001; Baylor 2002; Cuckle 2002; Granger 2002; BECTA 2004; Dale 2004; Barton 2006).

There have been many suggestions in the literature to overcome the issue of the lack of training in ICT in schools which I think are very applicable to the Smart Schools in this study. According to Baylor (2002) the best option is in-service training specifically designed to meet teacher needs, based on their individual level of experience and skills in ICT (BECTA 2000). Such courses can be conducted by a full-time ICT coordinator who has been appointed by the Ministry of Education and is available in every Smart School. As for overcoming the lack of time for training, it has been suggested that the best way to tackle this problem is to provide non-contact time during school hours (BECTA 2002).

It is very important to appreciate that Islamic Education teachers must be given the confidence to feel in command of new technologies before they front a class.

so that they know how and when to use the technologies and how to handle student behaviour. PCAST (1997) reported that teachers are not satisfied with most technology-related courses which only show how to operate a computer. What they also need is training on how the computer can enhance their teaching. The PCAST board recommended that training should provide assistance on how to integrate computer use into the curriculum and give pedagogic support to reconcile the tensions between the traditional and new pedagogic methods for using technology.

The other training options to be considered by schools are to send out Islamic Education teachers on other professional developmental programs outside their schools' boundaries and to provide incentives to attend seminars, workshops and conferences to enhance their knowledge in ICT (Baylor 2002). This latter option is more difficult to implement due to the shortage of teachers in schools and the need for cover when the teachers attend for external training. However, providing cover is not impossible if the schools plan teacher absences very carefully in advance to avoid the shortage of teachers in schools.

8.3.5 More Time to Familiarise with Technology

The issue of "not enough time" raised by Islamic Education teachers and their students needs to be considered in order to ensure the success of technology integration in classrooms. There are three major factors in this study that have contributed towards the issues of time consumption when dealing with computers.

First, the outdated hardware and computers, second, slow Internet connection, third, the distance of computer labs from classrooms.

The fact that Islamic Education teachers and students are overloaded with a heavy syllabus and overburdened with examination pressures has made them more conscious and concern of the precious value of time and the necessity to avoid time wasting. In this study, I have found that the teachers and students are not convinced that new technology in Smart Schools can help them in delivering the heavy syllabus and preparing for examinations. As a result, learning with technology does not always go as planned and often ends up with time wasting.

However, the need for Islamic Education teachers and students to have more time to use computers and to access the Internet should not be ignored. 90% of Islamic Education teachers in this study would like to have more time to use computers and 87% to access the Internet. The students also expressed the need for more time to spend on computer use (63%) and Internet access (70%).

In this study the Islamic Education teachers probably needed more time to use computer because they had less opportunity to use computers compared to the students due to time constraints and other commitments such as "school meetings", "classroom administration work" and "marking student's work". They also complained that they rarely had "free time".

Much evidence from the literature (Mumtaz 2000; Collinson 2001; BECTA 2004) points to the fact that teachers do need more time to incorporate technology into their classrooms. Collinson (2001:270) said that teachers need more "discretionary time and unpressured time" where they are set free from schedule responsibilities and are able to do things they like to do. They need time before feeling comfortable with technology, finding resources on the Internet, developing lesson plans and trying out ideas and strategies before sharing them with the students. Time is also crucial for teachers to interact with other colleagues and share what they know while at the same time learning from them.

8.4 Lessons that can be Learnt from Teachers and Students about Technology Change in this Pilot Project of Smart Schools which can be used to Enhance the use of ICT in Islamic Education in the Next Roll-out Phase of Smart Schools

8.4.1 The Issue of Computer Access in Smart Schools

The outcome of this research shows that there has been an obvious increment of ICT hardware and software in Smart Schools even though there have have been complaints about lack of computers in some schools. However, the most striking outcome is that the computers were rarely used in the classroom and there were many problems in integrating them into Smart Schools in general and into Islamic Education in particular.

The lack of computer and ICT resources and the difficulty in booking computer labs are the two main reasons given by Islamic Education teachers for not using computers in their teaching in Smart Schools. A lack of competence and confidence are other reasons cited by some Islamic Education teachers but this assertion is made less frequently compared to the lack of resources. The current computer ratio in secondary schools students in Malaysia is 1:26 (MMoE 2004). This is far higher than is encountered in other countries like the US, Australia and the UK with less than 4 students per computer.

Based on the ratio of computer to student in Malaysia above, it is unlikely Islamic Education teachers and students are able to use computers regularly in their teaching and learning activities. It is very difficult if not almost impossible to share one computer with 26 students in a classroom. Research suggests that teachers believe that one computer to four students or less is the best ratio to indicate sufficient computers in schools (USDoE 2005). Much research also asserts that access to computers and teacher confidence in ICT are related to the availability of ICT equipment and the ratio of computers to students in a school (Goodison 2002; Prior 2004; Tearle 2004).

However, the problem of insufficient computers and hardware is not only confined to Malaysia. It has also been reported in worldwide research on obstacles to computer integration in learning (PCAST 1997; Mumtaz 2000; Fullan 2000b; Tawalbeh 2001; Cuban 2001a; Nichol 2003; Warschauer 2003; BECTA 2004; Ilomaki 2004; MMoE 2004). There is much research in other countries even with nearly perfect one to one computer ratio like the US and the UK that teachers still believe that even at this level of computers availability still not sufficient enough (Cuban 2001a; Reynolds 2003; Tearle 2004; Sime 2005).

The computer/student ratio in Malaysia is nevertheless acceptable compared to that in other countries like Brazil 1:42 (OECD 2006:1) and Lithuania 1:90 (Pelgrum 2000:7). The most important question here is how to make the available resources more accessible for Islamic Education teachers and students in Smart Schools. The location of ICT resources is seen to be an important factor in encouraging their more frequent use in lessons. The idea of having sufficient computer labs to accommodate all subjects is not very helpful. The distance and difficulty in booking were the two main problems cited by the teachers for not using computer labs. Some of them also mentioned the difficulty to control students in the computer labs where they behave differently from their classroom environment.

Budin (1999) reflecting on the history of computer labs and after decades of their existence, said that educators had now begun to question the separation of computers from the real context of classroom life and the separation of the computer curriculum from the rest of the curriculum. The idea of having computer labs for teaching computer literacy and isolating them from other subjects was no longer valid. There are demands to integrate computers into the normal classroom and this breakthrough is an important milestone in allowing computers to take their rightful place as a key tool in educational reform in schools.

Recent research in the UK has found that Interactive Whiteboards are regularly used in the classrooms (Tearle 2004; Wall 2005; BECTA 2006b). Becta (2006b) showed that Interactive Whiteboards are the most popular ICT resource among teachers with 42% of secondary teachers and 69% of primary teachers using them in half or more of their teaching. Access to an Interactive Whiteboard which is placed in every classroom is very high and much sought after; and many teachers feel something has been lost and missing when teaching takes place without Interactive Whiteboard (Tearle 2004). By actually putting the computers in the real classroom, technologies like the Interactive Whiteboard will hopefully encourage teachers and students to use them regularly in the next roll-out phase of Smart Schools and they can be integrated well into the normal environment of classrooms.

The recent literatures show that the paradigm of computer research in schools has shifted from the lack of hardware and infrastructure in schools to the more important question of how to integrate computers into teaching and learning. PCAST (1997:70) recommendation stated that

> "While a significant investment in hardware and infrastructure will be required if the promise of educational technology is to be realized, the Panel believes that the effective use of these resources to improve our nation's educational system poses an even greater challenge...In recent years, however, attention has increasingly focused on the ways in which technology might help to achieve some of the central objectives of educational reform, providing students with the ability to acquire new knowledge, to solve "real-world" problems, and to execute novel and complex tasks requiring the effective integration of a wide range of basic skills."

Recent research shows the shift in attitude of teachers who have in the past admitted not being very keen on computers but who are now more interested in

ICT and have adopted ICT in their teaching (Granger 2002; Ilomaki 2004; Tearle 2004; BECTA 2006b). Tearle (2004:22) said: "There was a strong suggestion that now ICT had 'arrived' and was more visible, not only was the negative attitude not evident, but a very positive one was in its place". There is more evidence from recent literatures that shows the positive trend among teachers for incorporating ICT in their subject teaching.

8.4.2 The Issue of Subject Teaching in Islamic Education

In principle, the Islamic Education teachers in this study agreed that computers have an important role in Islamic Education in the future and one of the most popular explanations is that it seems to motivate students to learn. The Islamic Education teachers reported that their students are more "enjoy", "creative" and "resourceful" in respect of the use of Internet resources and the brilliant multimedia displays. This has lead to the belief that ICT can increase student motivation in Islamic Education. Many researchers have found that ICT use can motivate students, increase commitment and engagement in their learning tasks, enhance enjoyment and increase self-directed learning and self-esteem among students in other subjects like English, Sciences and Mathematics (Edwyn 2001; DfES 2002; Hinostroza 2002; La Velle 2003; DfES 2004; Hennessy 2005; Sime 2005; Dawson 2006; Deaney 2006; BECTA 2006a).

The current circumstances of Islamic Education, moreover, demand innovations to refresh student motivation. This subject at the present time is not a defining subject to obtain a place for competitive courses at the university. Therefore, according to Islamic Education teachers, the students concentrate more on popular subjects like Biology, Physics, Chemistry and Mathematics than on other subjects including Islamic Education. The greatest challenge for Islamic Education teachers is to enhance their students' enjoyment and commitment in learning about Islam. Based on views from the students in this research, I believe ICT can make a beneficial contribution in this area. The students' positive responses on many occasions is also leading Islamic Education teachers to believe that ICT can indeed make lessons more interesting and therefore they are looking forward to engaging students better by learning how to use ICT.

This study has found that computer use in Islamic Education is very low even though the general response from the students is that other subjects also fail to make good use of computers in their classroom. In this study, 73% of the Islamic Education teachers said that they never use computer every week and only 15% said they use one computer for at least an hour a week. This level of computer use is far too low compared to findings for computer use among teachers in the UK. A recent report from PricewaterhouseCoopers (2004) found that 48% of teachers use computers between one and three hours everyday, 28% used one computer up to one hour every day, 19% use computer between four and six hours and 7% use a computer for over 6 hours a day.

According to students, Science teachers of Biology and Physics appear to be the most regular users of computers in their teaching. Clearly, there are differences between subjects and the levels of computer integration into the classroom. Even though the main reason given by this group of Islamic Education teachers for not using computers is the difficulty of access, another reason cited by them is very interesting to ponder upon. It concerns the nature of the subject of Islamic Education itself.

These teachers believe that the nature of Islamic Education is different from Science, therefore not all the topics in Islamic Education are appropriate to be delivered using computers. Unlike Science students whose study of the physical world is based on scientific methods, Islamic Education is a combination of the physical and the metaphysical world and is based on Divine knowledge. However, this does not mean that Islam is against Science because the majority of Islamic scholars are agreed that scientific knowledge does not contradict Islamic teaching and can exist in harmony with Islamic belief (Bakar 1999; Nasr 2005).

Many researchers claim that differences in subject cultures affect teachers' use of ICT even though there is less research which seeks to explain in detail how and why this happens. Hennessy (2005:7) explained that teachers are reluctant to adopt a technology which seems incompatible with "the norms of an antecedent sub-culture" and they only accept the innovations when it suits their existing subject practices, content and pedagogical paradigms. Traditionally, computers have been closely associated with subjects like Mathematics, Science and Technology and less associated with subjects like English and the Arts. There is a fear that the culture of computing and technology can be a threat to colonize the curriculum in these subjects.

One of the main topics in the Islamic Education curriculum has long been reading, writing and memorization of al-Quran (the Holy Book). The way of teaching al-Quran is based on the long-time tradition which goes right back to the time when Prophet Muhammad received the first revelation from the Angel Gabriel. This method of *talaqqi* (face to face between teachers and students) emphasizes the techniques of *musyafahah* (listening and repeating the teacher's reading) and *hifz* (memorization). These techniques are still being widely used in delivering Islamic Education in Malaysia.

Wagner (1980) showed that students as early as 4 years old have been trained to memorize al-Quran by following teacher's chanting of Quranic verses. Boyle (2002) reported on the pedagogical strategies of the traditional Quranic Schools in Morocco which utilized a good coaching of one-to-one instruction between teacher (fqih) and students and of group (halaqah) coaching in which students are seated on the floor around the teacher (fqih). Obviously these methods that rely heavily on a teacher- dominated culture are different from the culture of computer-based learning. It will be very interesting to see how Islamic Education teachers respond and react to accommodate their old traditions and practices with the new teaching practices in the next phase of implementing the Smart School curriculum.

The aim of Islamic Education is to foster a balanced growth of all sides of the human personality including the physical, the spiritual and the intellectual to lead to a higher level of religious understanding and commitment in all areas of life. Therefore, *tarbiyyah* (education) in Islam which comes from the Arabic root

Raba (to grow, to increase) refers to the development of the individual's potential and to the process of nurturing and guiding the child to a state of completeness or maturity. There are two important elements in *tarbiyyah*: firstly *taalim* which comes from the Arabic root *alima* (to know, be informed), refers to the imparting and receiving of knowledge, usually through training, instruction or other form of teaching. Secondly *taadib* which comes from the Arabic root adaba (to be refined, disciplined, and cultured) and refers to the process of character development and learning a sound basis for moral and social behavior within the community and society at large.

Therefore, the objective of Islamic Education is not only to transfer knowledge but also to educate and improve the act and behavior of the individual's personality and character (al-Attas 1979; al-Attas 1980). It will be very challenging for Islamic Education teachers to find ways to achieve the objective of improving social behavior according to Islamic teaching by the use of ICT.

Different levels of ICT integration between subjects also happen because of teachers' experiences, knowledge and expertise (Granger 2002; Harrison 2004; Hennessy 2005). ICT in Islamic Education is relatively new compared to other subjects like Science and Mathematics. It is to be remembered that these Smart subjects' teachers have been trained systematically by Ministry of Education personnel to integrate ICT in the classrooms (MMoE 1999a; Chan 2002). The dedicated Sciences and Mathematics learning materials and software for primary and secondary schools have been developed by TM Smart School since 1998 and it is not difficult to find learning materials from other resources like the Internet.

Therefore, it is not surprising that Islamic Education teachers make less use of computers in their teaching than other colleagues.

8.4.3 The Issue of Heavy Syllabus and Exam Orientation Curriculum

The problem of a heavy syllabus and the examination orientation in Smart Schools should be replaced and revamped with a more balanced curriculum and a holistic approach. The pressure of examinations is considered very strong by the teachers and students in this study and they have been reluctant to use computers which they think are not very helpful for examination preparation. This trend will certainly not be helpful for the next roll-out phase of Smart Schools and I believe that if the Ministry cannot find a solution to this problem, the trend will go on and it will jeopardize the Smart School aim to integrate ICT into teaching and learning.

According to the students, computer use is less when the final year examination is approaching and use is also less in classes which are involved with major examinations such as Form Three and Form Four. Islamic Education teachers and their students are not confident that the computer could help them prepare and revise for examination. Instead, they are more confident in using national textbooks as their main resources. These Islamic Education teachers and students said that at the end of the day the examination will be based on national textbooks and not the computers.

The Ministry of Education has realized how great is this problem in our educational system. It has forced our Malaysian Minister of Education, Datuk Seri Hishamuddin Hussin (2006) to conduct a major revamp of our educational system. He made a pledge and assurance that in stages this major revamp will make our education system less exam-oriented by 2010. It would start by reviewing the current evaluating system for student achievement. It would also reduce the subjects taught in schools and replace the current term system which based on annual examinations with a semester system in an attempt to reduce examination pressures on teachers and students.

Evidence from this study indicates the real challenge is to change the current evaluation practices that emphasize memorization of facts and figures rather than understanding and comprehension of the subject taught. According to the Islamic Education teachers and students in this study, the facts and figures for examination in Malaysia are solely based on national textbooks that force them to stick to the textbooks to an extent which discourages the use of computers.

Another challenge is to find an alternative to the current student achievement evaluation system which is solely based on one major final examination like the Lower Secondary Examination (PMR) and the Malaysian Certificate of Education (SPM). Perhaps a system of continuous evaluation throughout learning would be more beneficial than concentrating on the outcome of one final examination and perhaps this is what the Minister of Education is after when he suggested a semester system over the current term system.

A balanced approach is also needed to revamp the current syllabus which, according to the Islamic Education teachers, is "too heavy and in-depth". They said that they have to deliver the heavy syllabus within a fixed period of time which makes them more particular and sensitive over the time. The planning to reduce the syllabus taught in schools as announced recently by the Minister of Education will allow more time for teaching the remaining topics. Findings of this study show that the most important thing is to review and to revamp the Islamic Education syllabus itself, as it is too heavy for the students.

However, research shows that although certain subjects may integrate well with ICT, it does not necessarily help students to do well in examinations. Harrison (2004) said that English enjoyed the highest percentage of students' engagement with ICT but the association between ICT engagement and attainment in examination was weak. What students did on the computer in researching English on the Internet and presentation work had little effect on their examination results. Meanwhile revision materials and software for Science subjects are highly relevant for examination because these materials and software are similar in form and contents of examination.

8.4.4 Time Constraints

In this study, the Islamic Education teachers in Smart Schools said that they have too little time to integrate computers in their classroom. This is a common problem and leads to ongoing concern in the process of educational change in general and technology change in particular. The literature shows that time constraint is one of the main barriers and challenges, in the process of educational change in general (Fullan 1992; Leithwood 2002; Hargreaves 2005) and of technology change in particular (Fishman 1992; Fullan 1992; Mumtaz 2000; Hayward 2002; BECTA 2004; Selwood 2005).

It is important for the Smart School initiative to progress in the next phase, to provide time and opportunity for Islamic Education teachers and for their students to become learners in the process of change. Learning and professional development should be an essential and integral part of Islamic Education teachers' work and objectives in Smart Schools. It is the responsibility of the authorities in Smart Schools to identify the allocation of time and to provide substantial time for Islamic Education teachers to develop their knowledge and skills. Lack of discretionary time, common time and designated time provided by schools have been identified as barriers for teachers to share their knowledge, ideas and skills with colleagues and with teachers from other schools (Collinson 2001).

It is interesting that these Islamic Education teachers pointed out that, contrary to popular belief that ICT and computer technology can help to save time and reduce workloads, preparation to incorporate computers in their teaching is "very taxing and time consuming". They said that ICT take-up and computer use in teaching incur heavy costs in their time and workload and may not help them to reduce their current burden. The current technology changes may not lead immediately to a reduction in time and workload because they have not been used widely and the efficiency gains from ICT may only be seen later.

PricewaterhouseCoopers (2004) who were commissioned by the Department of Education and Skills UK to investigate the use of ICT in addressing teachers workload reached the same conclusions as the teachers that particular tasks take longer to accomplish using ICT though some teachers reported a small timesaving from the use of ICT across a range of teaching tasks such as recording and reporting students progress and lesson planning. The majority of teachers reported a small timesaving but the average of time lost reported by teachers was longer than that time saved. PricewaterhouseCoopers found that teachers saved two hours of time for teaching and reporting students' progress using ICT compared to teaching and reporting without using ICT.

Many researchers have reported that teachers found that their tasks became easier once they had become familiar with the use of computers and ICT (Owston 2001; Hayward 2002). Training and professional development in ICT helps the teachers to gain confidence and efficiency in using computers and ICT in classrooms (Lee 1997; BECTA 2005; Sime 2005). The level of efficiency of computers use is related to the maturity and proficiency of a user's ICT skills. As stated earlier, Islamic Education teachers said that they need about one to three years to learn about computers and to become familiar with ICT use in the classroom.

8.4.5 The Importance of Involvement of All Subjects in the Next Roll-Out Phase of Smart Schools

From this study, it is crystal clear that the involvement of all stakeholders in Smart Schools is vital to ensure the success of the next roll-out phase of Smart Schools. The implementation of this roll-out phase should be extended to other subjects and incorporate all teachers in Smart Schools. This study has found that Islamic Education teachers are not keen to incorporate ICT in their classroom because they claim that Islamic Education is not a Smart subject. The teachers rarely incorporated ICT in their classroom and assume that only Smart subject teachers are responsible for delivering their teaching using technology.

The policy of the Ministry of Education to implement this initiative to only four subjects, Mathematics, Science, English and Malay, has clearly contributed to this phenomenon. This phenomenon has divided the Smart School teachers into two categories, one which has been trained systematically and well equipped with hardware and software and the other of teachers who have not been trained properly and have had fewer opportunities to secure training. While the first category has had all they need to incorporate ICT in their whole teaching, the latter has had been left unsupervised to sort out their own training and efforts to incorporate ICT in their classroom.

Another vital aspect of change to take into consideration in the next roll-out phase of Smart Schools is personal and mind-changing of teachers and students. The mindsets of the students and especially the teachers need to be attuned to the objectives of Smart Schools. This can be done with rigorous briefings, seminars, workshops and training courses to ensure the Smart Schools' objectives are fully understood. This study shows that at the beginning of Smart Schools, Islamic Education teachers and students were not very receptive towards the ideas behind Smart Schools because of lack of information and ignorance. This led to negative feelings of obligation and a sense of belonging to follow the reform agenda. Fullan (2000a) reminded his readers that reform will never occur on a large-scale until teachers escape from the mindset that they are always implementing someone else's reform agenda.

8.4.6 The Importance of Teachers' and Students' Views in the Process of Change

There is a big debate on the effectiveness and success of such a large-scale reform as the Smart School initiative and on the best way it should be implemented (Fullan 2000a; Fullan 2002; Leithwood 2002; Marchesi 2002; Riley 2002; Riley 2004; Shakeshaft 2004).

Based on the views of Islamic Education teachers in this study, I would like to suggest two important points in the implementation for the next roll-out phase of Smart Schools. First, it is essential to gather information from the grass roots before any implementation especially for such a top-down reform. There was a lack of teacher and student involvement at the beginning of Smart Schools' pilot project. Indeed, it is very important to seek teacher advocacy and support in the initiation of educational change and reform as suggested by Fullan (2001).

Second, it is essential to give time for the teachers to digest the ideas of reform and to find the best way to implement the planned innovations in their classroom. Many researchers such Hargreaves (2005) and Fink (2003) have found that teachers in early and later stages of their career are different in their flexibility, sensitivity, views and energy toward change. The newly qualified teachers are more compliant towards change while the old hands in the later stages of their career are less keen and resist change. They need more time to adapt to a new environment.

Over the years, Malaysian teachers have had new policies imposed on them from the authorities and these have been difficult to assimilate. Fink's study (2003:126) proved that over time, the creativity and internal innovations inside schools will disappear when too much "external context dominates internal contexts".

This study has found that many Islamic Education teachers have said that they have never been involved in this process of change and have had less opportunity to have their ideas heard in this top-down project. Many literatures suggest that it is very important for the authorities to hear and understand the needs of teachers and students in the process of change.

Cuban (2001) argued that the failure to understand the intractable workplace conditions of schools and teachers' needs has led to the failure of high-tech investment in schools. He said: "For hard-core techno-enthusiastic policy makers, the answer to limited classroom use and continuing traditional instruction is simple: look no further than the teachers". The unique classroom environment and teachers' overloaded daily routines in the school need more attention from the authorities. Cuban suggests a very simple solution for them, to look back at the nature of teachers' work and understand their needs and views in order to understand the failure of computer use in schools.

8.5 Summary

This chapter tries to answer the research questions posed in this study based on evidence provided by the focus groups, the survey and the in-depth interviews. The discussion focuses on the views and attitudes of the teachers and students, the barriers to implementing new technology in the classroom, and the needs of participants in this study. Lastly, the discussion explains the lessons that can be learnt from this study of the Smart School pilot project.

Overall, this chapter reinforces the findings from previous chapters regarding the use of computers and ICT in Smart Schools and clarifies the needs of Islamic Education teachers and students in implementing change in their classrooms.

Chapter 9 Theoretical Contribution and Suggestion

9.1 Theoretical Contribution and Advancement

9.1.1 Curriculum Change: Importance of Participants' Views

This study started with a theoretical framework that emphasized the importance of Islamic Education teachers' and students' views in understanding the process of change in Smart Schools. This research upholds the importance of the views of the Islamic Education teachers and their students in judging the outcomes of the implementation of the Smart School concept. This research tries to understand the changes brought by the implementation of the Smart School on educational life from within the classroom itself not from outside the classroom. This study has tried to understand the curriculum changes in Smart Schools not from the cost effect of the input and output of standardized national achievement test scores but rather from hearing views on and experiences of change at the bottom level.

Some studies have looked at curriculum change and policy implementation by measuring the effect using examination output at the national level while others have looked at how far the schools have coped and complied with the national change in standards and a nation-wide standardized curriculum. However, according to Hammond (1990), this mode of policy research has not examined in-depth the conditions of change and has failed to explain the effects at lower levels in schools and classrooms. The input and output approach to examining change has failed to answer the basic question of whether change has really happened inside the classroom which is the most important place where the changes need to be implemented. This approach has even failed to understand how participants attempt and succeed to incorporating changes within the classroom despite the many constraints that confront them in the process.

This study has attempted to look at the implementation of the policy by talking to Islamic Education teachers and students as participants and implementers of change. This new way of looking at the implementation of Smart School initiatives has given an opportunity to access new information and understanding of the local contexts of change in these schools. It has brought to light new information and understanding at the local level of the effects on Islamic Education teaching in Smart Schools which should be very beneficial for future roll-out phases of Smart Schools. It has also provided new knowledge on the local meaning of change from the perspectives of Islamic Education teachers and students in Smart Schools where there has been little knowledge about it previously.

There are many constraints and conditions in the classroom environment that can support or undermine the intention to implement change and these constraints and conditions are different from one classroom to another, from one school to another and from one subject to another. To understand these constraints and conditions, I believe that it is very important to talk to Islamic Education teachers and students who are involved in the process of change. It is impossible to ignore and underestimate the power of those at the bottom over those at the top and the power of teacher resistance towards changes. By talking to the teachers, it is possible to gauge how they will react and adapt to change at the classroom level rather than blindly adopt change from top-down.

In this study, the voice of the Islamic Education teachers has provided us with a key to understanding the critical problems brought about by the transformation of the Smart School blueprint from conception to implementation. This study has helped the researcher to understand the conditions and the constraints faced by the Islamic Education teachers and students along the change process. It is very important to understand the teachers' experiences and responses to change, if change is to be sustainable and successful (Hammond 1990; Fullan 2000a; Fullan 2001; Hargreaves 2005). This study shows that the local circumstances and the local conditions in which Islamic Education is conducted is different from other subjects, so not all of the changes in Smart Schools will suit all local contexts in respect of Islamic Education.

Hammond (1990) said that it is crucial to understand the local meaning of change from the teachers' and students' perspectives. Investigation on the local meaning of change can suggest how far the changes may affect the teachers' and students' work, the real implications of change in the classroom, and the teachers' own understanding and interpretation of policy makers' intention based on their knowledge, beliefs and teaching practice. Teachers' understanding and acceptance of a specific change initiative can encourage them to embrace the change fully and not adopt it superficially. Fullan (2000a:7) said that under great pressures to change, some schools have adopted innovations which they are not capable of putting into practice. He said: "Innovations, thus, were adopted on the surface with some of the language and structures becoming altered, but not the practice of teaching".

The survival of top down change policies like the Smart Schools largely depends on the teachers' ability to adapt to the changes through experimentation and continual learning during the implementation of change. Teachers will not favour persisting with the change if the change runs counter to their beliefs and practices. Top-down change in policies can control but is unlikely to construct teachers' practices and as soon as the pressure of enforcement ends, their normal practices will prevail again. Thus, the motivation of teachers is critical to ensure the success of policy changes and local factors that motivate these teachers are likely to differ from one context to another. The local factors that have motivated the Islamic Education teachers and students to commit themselves to change in this study may well help to enhance the use of computers in the next roll-out phase of Smart Schools.

The challenge for large-scale reform like the creation of Smart Schools is to sustain and develop the concept. This is far harder to achieve and maintain than simple to initiate it on. Fullan (2000a) after years of investigation of educational change, came to the conclusion that elementary school improvement takes 2 to 3 years to accomplish, high school improvement may take 5 to 6 years, district level progress may take 6 to 8 years, and we have no idea how long it takes to reform the entire state and country. There is still no clear idea how far national-scale reform like that of the Smart School can evolve. It is only to be hoped this research has given some insight on the views of the participants regarding large-scale reform. This study offers an important understanding of the middle process of transforming this particular change in educational policy to teacher action in classrooms from the point of view of the teachers themselves.

Leithwood (2002) showed that out of five large-scale reforms in the USA, Australia and New Zealand only one achieved a significant increase in student achievement and change in classroom practices. Perhaps this was because the practice of change was not sufficient to improve student achievement, or the practices were too poorly specified and complicated; or maybe the implementation was worse than anticipated. Most large-scale practices have focused on academic outcomes and paid little attention to learning activities within the classroom. Leithwood (2002) suggested that we should look into the process of measuring large-scale reform outcomes and use a wide range of tests and non-tests based on students' engagement to measure change outcomes.

This research has also emphasized on the student views on change. In this study, Islamic Education students have been encouraged to express their views based on their own experience of change. Quite often, the voice of students is neglected in the process of change. There is often a doubt that young people can participate and review problematic situations and relationships in the complicated process of change in schools. However, Blossing (2005) argued that we should not deny the right of people who make up the majority of the school population and involving them is the way to show that the democratic model is working at schools. It is very important that the student voice is heard, especially at the local level of change since they possess vast resources of observation and knowledge about school life which they monitor on a daily basis.

Schratz (2005) said we should engage more with students' reality and provide an alternative communication mechanism by which students are able to articulate their observations about their experience of school life and this cannot be achieved without changing the existing discourse practice. Schratz said that while outside the classroom young people take up their own responsibility regarding real life, in schools we still try to teach them about life but restrict their opportunity to participate in any decision- making. Blossing (2005) said that teachers rarely got responses on their work from school leaders and adults; instead teachers received the most importance response from students that shaped their work's improvement. This shows how important it is to calculate student views in any change initiative especially when it comes to teaching and learning activities in the classroom.

However, in this study, I found it hard to take into account all the views of the teachers and students. Some views would be very difficult to implement and some need extra thought and modification before they could be implemented. For example, the need for a comprehensive piece of software which would cover every single topic in the Islamic Education syllabus would be very difficult to build and implement. Event if the Ministry were able to do it, the use of one piece of software would not solve all the current problems in Islamic Education. A single piece of software itself would not motivate students to learn for long and there is much research to show that only by the creativity of the teachers, can a piece of software be integrated well in the classroom.

On reflection, I think it is important, in fact crucial, to find out other stake holders' view on the change process. The change process is not a straightforward process as we always think. It involves a very complicated set of processes especially when it comes to large-scale reform like Smart Schools. In this study, I have found cross-structure problems in the process of implementing the change, so it is important to understand other stakeholders' views as well. Islamic Education teachers and students will find themselves facing and interacting with other reform stakeholders, not only inside the schools but also outsides of schools, like the Ministry, parents and the community. Teachers will also continue to find themselves facing the pressures of high expectation and demands from their own schools' authority.

I also found that Islamic Education teachers and students are facing cross-culture problems. The current evaluation tests and examinations did not help them to participate progressively in this change. The demands to perform well in examinations and bear a heavy loaded syllabus have limited the teacher options to creatively change their teaching practice as required by the Smart School new pedagogy. On the one hand, they were requested to deliver the heavy syllabus in a short period of time and on the other hand, they think the changes are not very supportive in this matter. This study also shows that the subject culture to some degree has contributed to this problem. Long-time teaching practices driven and dominated solely by teachers are not easy to change. Perhaps it is understandable that there is not much evidence of self-access and self-directed learning taking place in the Islamic Education's classroom.

9.1.2 Technology Change: The Importance of the Pedagogical Aspect and Cost Effectiveness in Learning

The Smart School blueprint shows how important technology is in Smart Schools. Technology was expected to be the enabler to transform traditional Malaysian schools into Smart Schools. This research began with the objective of understanding the current change in Smart Schools from the point of view of Islamic Education teachers and their students in Smart Schools. It is very important to understand the difficulties for and the needs of Islamic Education teachers and their students in this initiative from their own point of view.

It is also believed that the attitudes of Islamic Education teachers and students are critical for determining the successful implementation of the Smart School initiative. Many efforts to transform schools into more technology-oriented institutions have failed because of the teachers' resistance and resilience. Thus, schools seem to be slow in embracing ICT and to have a persistent resistance to change (Cuban 1993; Fink 1998; Fullan 2001; Reynolds 2003)

Technologies such as computer applications frequently imply a critique of the existing teaching practices in schools. The new technology is alien and thus seen as posing a threat to teachers especially to the older teachers who have become accustomed to a comfort level in their work (Hodas 1993). Teachers may feel that the less-structured classroom environment required by interactive computer projects threatens their role as experts, their expertise and mastery, and their leadership in the classroom.

The study has found serious problems in the process of implementation of Smart Schools and the effort to prepare teachers and students to use computers and technology. Barriers like the lack of availability and access to computers, the lack of training and professional development, the lack of time to familiarise themselves with technology, a heavy syllabus and examination pressures, all of these barriers prevent Islamic Education teachers and their students from using computers regularly. Moreover, their request for more training and greater computer availability has failed to find a positive response from the authorities.

These teachers and students' attitudes towards computer are very positive. There is no evidence to show that they have resisted the use of computers. In fact, there is evidence to show that these teachers and students eagerly want to learn more about computers and support the use of computers in classrooms.

Some of the most interesting findings in this study are about their views and perceptions on the use of computers and ICT. In their discussion on the concept of culture in Islamic studies and the use of computers and ICT, most of the teachers said that not all of the topics in Islamic Education are suitable to teach with the aid of computers and ICT. This needs more clarification and further research to determine the appropriate pedagogical approach for teaching Islamic Education using computers and ICT.

Teachers need time and opportunity to practise and develop their IT skills and all the evidence points to this. The literature shows teachers need 5-6 years to master the techniques and skills to teach using computers (Hadley 1993). Teacher competence depends on practice and experience. The more teachers use computers the better skilled and practiced they will be. Less experienced teachers using computers to enrich and reinforce their subject will gradually became more experienced and start to develop a creative new approach to deliver the curriculum.

9.1.3 The Influence of Subject Culture

This study has also found very little evidence that Islamic Education teachers have altered their practices in the classroom and the way they teach. The main purpose of ICT for Islamic Education teachers has generally been confined to administration works and lesson preparation. One possible explanation for this according to Hennessy (2005) is the lack of teacher involvement in designing and implementing ICT reform in schools and their lack of involvement in defining ICT roles in subject curricula. Much research also shows that large-scale reform failed to involve teachers in its design and implementation (Fink 1998; Fullan 2000b; Cuban 2001a; Conlon 2003). Top-down reform like that for the Smart Schools often neglects the local needs of teachers in the classroom and makes it hard for them to outline their particular workplace constraints.

In the Smart School blueprint, it is clear that ICT should be a cross-curricular skill, with every subject required to integrate it into its curriculum. There is no specific subject which owns ICT. However, the perceptions of Islamic Education teachers and students show a legacy of belief that computers are the domain of certain subjects like Science and Mathematics. A suspicion about other subjects still deeply exists in the minds of these teachers and students. The use of ICT labs in many Smart Schools has been dominated, occupied and colonised by subjects with strong ties with science and technology. Islamic Education teachers in this study clearly settled for a lower priority rating in using computers and ICT yielding access to the Science and Mathematic teachers.

Hennessy (2005) found in her study a relationship between subject teaching and authority policy on ICT. She found a strong evidence of high pressure to integrate ICT in Mathematics and their teachers were the least reluctant to use ICT in the classroom. Meanwhile, English which is a subject in which less pressure from authorities to integrate ICT into the curriculum, most of their teachers rarely use ICT in their classroom, make less use of it as a tool in teaching, show greater anxiety in using it, and are more reluctant to surrender to colonization by it in their subject.

Many researchers have shown that ICT is not appropriate for the nature and content of some subjects. Whereas some subjects are strongly influenced by ICT and have few if any problems in its use, some subjects were rejected as being unsuited and their teachers are more reluctant to make use of it in their teaching

(Selwyn 1999; La Velle 2003; Hennessy 2005; Deaney 2006). Selwyn (1999: 37-38) said that the fundamentals of subject content that requires the reading of "authentic" literature, like in English, has contributed toward the rejection of ICT. Selwyn also compared the ideological clash between the "sporty and healthy" nature of Physical Education and that of cold and inactive computer whose very nature does not easily fit in with Physical Education and thus prevents greater use in the subject.

Subjects with a social and humanity background like Religious Studies, Arts, Languages, Humanities and Physical Education in general make ICT integration difficult and at odds with computer use. Selwyn (1999: 38) found ICT use heavily biased towards Science and Mathematics and against humanities and other social science subject. Computers he perceived as lack of "personal", "cold", "logical", "unfeeling" and "linear" which is not compatible with "human quality" and is "intrinsic" to social and humanities studies.

This study has identified relevant issues from previous studies on the influence of subject teaching in integrating ICT. It has enhanced the knowledge on the subject influence in teaching Islamic Education and has identified key elements in Islamic Education as a subject which was thought to be special and have unique attributes that should be considered in implementing ICT. This study has also identified teachers' concerns and cautions about the impact of ICT on the core and fundamental teaching imperatives of the subject.

Islamic Education teachers in this study have said that it is difficult to teach some topics using computers. The nature of some subject topic in Islamic Education like al-Quran (The Holy Book) and Aqidah (The Creed or Belief) are difficult to deliver using ICT. These two topics need more guidance and special attention from the teachers and this cannot be achieved by using a computer. The difficulty in understanding a complicated discussion of God`s attributes in Aqidah and the fear that students will misunderstand them has made Islamic Education teachers believe that a culture content of Islamic Education is inappropriate with computer and ICT use.

Not less difficult than the teaching of Aqidah, is the nature of teaching al-Quran. The nature of Quranic teaching involves memorization which requires consistent exercise of the skill to memorize. Equally important to the actual memorization of the Quran is the art of learning to recite the Quran properly which requires reading skills from classical Arabic text and mastering the pronunciation of Arabic letters and words correctly. Not only this, but the students are also required to master the art of beautifying the recitation of al-Quran in a satisfying and pleasant-sounding rhythm. All of these requirements and skills in learning al-Quran are very difficult to achieve through computers and ICT use.

Boyle (2002) found that the method for Quranic teaching tended to be lecture, simply using chalk and talk, and far different from modern educational methods that emphasized on collaborative, student-centred and interactive learning. However, Boyle said that traditional Quranic teaching provides a very individualized education, tailored to students' needs and abilities. She also said one to one instruction with teachers can provide a variety of learning channels and a wider variety of learning styles compared to modern methods of learning. She also found that the rote memorization of al-Quran has a significant impact on students which "acts as a point of reference, a compass, as children grow older, understand more of what they have memorized and make decisions about the direction of their lives".

Though ICT can be sometimes not only incompatible with the nature of subject, it also can be inappropriate with subject pedagogy. Selwyn (1999) showed that computers pose a real threat to teacher's teaching practice when students are taken away to computer labs from the classrooms which are the teachers' traditional domain and territory. Teachers felt that they lost control and guidance of their own students in the computer labs and saw it as a threat to their traditional classroom practices. Many times in this study the issue of classroom control in computer labs and the difficulty of maintaining control in such an environment were raised by Islamic Education teachers.

9.2 Suggestion for the Future Roll-Out Phase of Smart Schools

9.2.1 The Involvement of Teachers' and Students' View in the Next Roll-Out Phase of Smart Schools

There is a big debate on the effectiveness and success of such a large-scale reform as the Smart School initiative and the best way of achieving it (Fullan 2000a; Fullan 2002; Leithwood 2002; Marchesi 2002; Riley 2002; Riley 2004; Shakeshaft 2004). Based on the views of Islamic Education teachers and students who participated in this study, I would like to make two important points for the implementation of the next roll-out phase of Smart Schools.

First, it is essential to gather information from the ground before the implementation especially for such a top-down reform. There was a lack of teacher and student involvement and consultation at the beginning of the Smart School pilot project. Indeed, it is very important to consult teachers in the initial planning of any educational change and reform as suggested by Fullan (2001). The Islamic Education teachers in this study say that they were never included in this process of change and had no opportunity to have their ideas heard in this top-down project.

There is considerable evidence in the literature that suggests it is very important for the authorities to hear and understand the needs of the teachers and students in the process of change. Cuban (2001) argued that the failure to understand the intractable workplace conditions of schools and teachers' needs has led to the failure of high-tech investment in schools. The unique classroom environment and the teachers' overloaded daily routines need more attention from the authorities. Cuban suggests a very simple solution for the authority; to look back at the nature of teachers' work and understand their needs and views in order to understand the past failure of computer use in schools.

Second, it is essential to give time for the teachers to digest the idea of reform and to find out the best way to implement the innovations in their classroom. The theory of "slow revolution" for ICT development in schools as suggested by

Cuban (2001a: 14) should be taken seriously in the next phase of Smart Schools. Many researchers such as Hargreaves (2005) and Fink (2003) have found that teachers in early and later career are different in their flexibility, sensitivity, views and energy toward change. Young teachers are more compliant towards change while those in the later stages of their career are more resistant towards change and need more time to adapt to a new environment.

Over the years, our teachers have had new policies imposed on them by the authorities and they have found them difficult to embrace. Fink's study proves that over time, creativity and internal innovation inside schools will disappear when the external contexts dominate the internal contexts. Schools in Malaysia should be given more authority to implement their own ideas and creativity. Hopefully this will become a reality with the recent announcement by Malaysian Ministry of Education of a cluster schools project.

With the emergence of more and more new challenges in schools, teachers are required to be ready to give up their own practices, and replace them with innovations by the authorities. In this case, they need to prepare their mindset for the complexity and uncertainty of changes in their schools. Fullan (1993) says:

> "Without such a shift of mind the insurmountable basic problem is the juxtaposition of a continuous change theme with a continuous conservative system. On the one hand, we have the constant and ever expending presence of educational innovation and reform. It is no exaggeration to say that dealing with change is endemic to post-modern society. On the other hand, however, we have an educational hierarchy operates, and the way that education is treated by political decision–makers results in a system

that is more likely to retain the status quo than to change. When change is attempted under such circumstances it results in defensiveness, superficiality or at best short-lived pockets of success."

9.2.2 The Importance of Involvement of All Subjects in the Next Roll-Out Phase of Smart Schools

From this study, it is crystal clear that the involvement of all stakeholders in Smart Schools is vital to ensure the success of the next roll-out phase of Smart Schools. The implementation of ICT should be extended to other subjects and incorporate all teachers in Smart Schools. This study has found that Islamic Education teachers are not keen at present to incorporate ICT in their classroom because they claim that Islamic Education is not a Smart subject. Islamic Education teachers in this study have rarely incorporated ICT in their classroom. They have assumed that only Smart subject teachers are required to deliver their teaching using technology.

The policy by the Ministry of Education to implement curriculum practices in only four subjects clearly contributed to this phenomenon. This phenomenon has divided the teachers in Smart Schools into two groups. One group has been trained systematically and well equipped with hardware and software and the other group has not been trained properly and offered few opportunities to secure training. While the first group had all they needed to incorporate ICT in their teaching, the latter was left unsupervised to initiate their own initiative and efforts to incorporate ICT in the classroom.

Another aspect of change that is vital to take into consideration in the next roll-out phase of Smart Schools is the personal mindset of teachers and students. Mind setting of the participants should be aligned to be compatible with the objectives and philosophy of Smart Schools. This can be done with rigorous briefings, seminars, workshops and training to ensure the clarity of the Smart Schools' objectives. This study shows that at the beginning of Smart Schools, Islamic Education teachers and students were not receptive to the idea of Smart Schools because of their lack of information and knowledge. This leads to the lack of feeling of obligation and a sense of belonging to follow the reform agenda. Fullan (2000a) has reminded us that reform will never occur on a large-scale until teachers get out of the mindset that they are always implementing someone else's reform agenda.

Chapter 10 : Conclusion, Limitations and Recommendations

10.1 Conclusion

The Ministry of Education in Malaysia implemented a pilot project of Smart Schools from 1999 to 2002. The Smart School is one of seven flagships in the Malaysia Super Corridor (MSC) initiative to take advantage of leading technology and to boost the Malaysian economy to attain the status of a developed nation by 2020 (Chan 2002). In the long-term planning, Smart Schools were designed to provide the MSC with knowledge workers for MSC companies and industries (EPU 2002, MSC 2007).

The Smart School initiative has been endeavouring to employ the leading technology of ICT in their educational process and trying to improve the traditional school management with the aid of innovative leading technology. Many researchers (Bajunid 2000, Chan 2002, Ya'acob 2005) have also argued that the Smart School is an attempt to revamp the current traditional teaching and learning practice in the classroom.

This study is an attempt to understand the impact of such educational change in Smart Schools on their Islamic Education teachers and students. In order to understand this impact, this study has emphasized the views of the teachers and students and taken into account their experiences in Smart Schools.

The key findings drawn from this study are:

1- The obvious change in Smart Schools was the increased number of computers and the emergence of new software and ICT equipment in schools

2- The access and the use of computers among Islamic Education teachers and students in Smart Schools are relatively low and less than that expected.

3- The most important barriers to the use of computers in Smart Schools identified by the Islamic Education teachers and students were: lack of computers and support resources, the difficulty to access the computer labs, the pressure of examinations, an overloaded syllabus and time constraints.

4- The needs of Islamic Education teachers in Smart Schools in this study are: more access to the computers, more training on computers, more time to get familiar with the use of new technology, the need for Islamic Education to be recognized as a Smart Subject.

5- The need to recognize that the influence of subject culture is very important in incorporating computers and ICT in teaching and learning Islamic Education.

6- The minimal involvement and participation of Islamic Education teachers and students in the planning and implementation process of Smart Schools.

10.2 Limitations of This Study

There are a number of limitations to this study. The most important concerns the research approach and design. The research was designed to seek the views of

Islamic Education teachers and students. As a result of time constraint and limitation, this study has neglected the crucial and important views of other influential personnel and teachers in Smart Schools especially the principals, the deputy principals and the IT coordinators. I found that many issues raised in this study are related to the authorities in the schools and to the IT coordinators especially on such issues as computer labs use and in-school training. I believe that many problems would be clarified if the schools' authorities and the IT coordinators become involved in this study.

In addition, I did not have an opportunity to include another important party involved in implementing Smart Schools in Malaysia, the Ministry of Education. The concerns of Islamic Education teachers in this study regarding the curriculum, syllabus, resources and planning directly relate to the Ministry of Education. If I were given the opportunity, I would want to extend my interviews with the personnel in the Technical Education Department of the Ministry of Education, which is responsible for monitoring the implementation of Smart Schools in Malaysia.

It is also recognized that the research method of data gathering may influence the outcomes of a study. This study had used focus groups, a survey and in-depth interviews to gather the data from the Islamic Education teachers and students. Though, I remained faithful with the above selected methods of data gathering in providing the views of Islamic Education teachers and students, it is worth standing back and reflect on the whole process of data gathering in this research.

The use of focus groups afforded very interesting and useful sessions. However, it was very difficult to find suitable times for the teachers to attend. The teachers were busy with their classes, relief classes and school meetings. This left many teachers unable to participate. These problems affected several sessions of planned focus groups in this study and reduced the number of the meetings intended.

Though the in-depth interviews provided very valuable information and in-sight views of classroom teaching and learning processes in Smart Schools, it would have been advantageous to support this information with observations from within classrooms. However, again, time constraints worked against this and there developed a feeling based on cultural sensitivity that Islamic Education teachers were reluctant to be observed for research purposes.

Nevertheless, the limitations in this study generally relate to time and financial constraints on the researcher. Despite these limitations, many valuable experiences and interesting views of Islamic Education teachers and students in Smart Schools have emerged.

10.3 Recommendations for Future Study

This study provides an initial survey to study the use of computers in Smart Schools especially in respect of Islamic Education. Little research has been done on computer use in teaching and learning in Islamic Education and there is much scope for future study. Even though it is beyond my capacity to generalise the result of this study, it is to be hoped that it will be beneficial for the future development of Smart Schools in all subject areas in all schools throughout the country. The following areas of studies are suggested for future research:

1- The influence of subject culture in Islamic Education to prevent or encourage the use of computers and ICT. The present study provides only initial information about the important of subject culture in Islamic Education and its influence on the use of computers and ICT among Islamic Education teachers.

2- The importance of a rigorous experimental research to develop Islamic Education software and its content involving teachers and students for the future roll-out phase of Smart Schools. An empirical study of technology-enabler pedagogy in parallel with software development is also recommended to ensure that the end-user knows how to use the software.

3- A large-scale research on the efficacy and cost-effectiveness of technology use in schools all over Malaysia. The present study has revealed that computers are under-used in Islamic Education and, given the amount of money spent on supplying schools with computers, an evaluation of the efficacy and cost-effectiveness of technology use in Malaysian school is strongly recommended.

4- As the issues of a heavy syllabus and examination-centred were regularly mentioned and raised many complaints from the teachers and students, the Ministry of Education should conduct a large-scale review of current Malaysian evaluation systems. It is very important to review and re-evaluate the current examination processes in preparing our children for the next information age. The teachers within this study articulated a dilemma between following the recommendations of the use of new technology in the classroom and responding to school targets to achieve success in the examinations. The outcome of study shows that Islamic Education teachers and students placed emphasised on the latter and bowed to the pressure to excel in examinations.

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Appendices

Appendix 1: Focus Group Interview Guidelines

I am Mohd Isa Hamzah from Universiti Kebangsaan Malaysia. Currently, I am doing my Ph.D at the University of Warwick, UK. I am doing research on "The Impact of Educational Change in Malaysian Smart Schools on Islamic Education Teachers and Students".

I am glad to meet all of you today. This session is called a focus group which hopefully will provide me with valuable information regarding my research. With your cooperation, this session will help me a lot.

I would like to talk with you all for an hour or so today. I would like to look at the changes that have gone on in your school as a Smart School over the past years. I would like to find out what these changes look like inside the school and the needs of teachers and students in this school.

Please do not hesitate to tell me whatever you think is important and significant to the topics. What you tell me is confidential and private. I will not report or repeat it to other people.

Focus Group Questions for Teachers

1. Could everyone introduce themselves and state their teaching experiences and academic qualification? (Ice-breaking session)

2. How long have you been teaching in this Smart School? Are there any differences between ordinary schools and Smart Schools in your opinion?

3. I would like to know something about this school and how it changed after pronounced as a Smart School for the last three years. How is it different being from the way it was before?

4. How things done now and what are you expecting for the future?

5. What do you actually do differently in your work as a result of these changes? Increasing workload? (probe for positive and negative answers and question the reasons behind)

6. How do you react and respond to the Smart School's concept?
(just follow the order, really needed, something new and interesting?)

7. How far can the teachers accept and adapt in this Smart School?

8. What are teachers' attitudes towards Smart Schools? How do they affect their acceptance or rejection? (probe for positive and negative answer). If negative attitudes then the researcher will ask for reasons:
   - Afraid to lose control
   - Comfortable with current status quo
   - Fear of failure if commit to goals for change
   - Too much commitment and workload
   - Lack of knowledge and experience in technology
   - Felt incompetent in front of students

9. Do teachers encounter any problems and barriers in Smart Schools?

10. Do teachers encounter any problems and barriers in technology use?

11. What do you think about the Smart Schools' curriculum?
    - Knowledge acquisition, integration and balance
    - Analytical, creative thinking and the ability to make decisions and problems solving
    - IT competency
    - Proficiency in an international language
    - Inculcation of values

12. What do you think about Smart Schools' teaching and learning?
    - Self-accessed, self-directed and self-paced learning
    - Quality of teaching process: teacher-student dialogue, clarity of explanation and appropriate approaches.
    - Meeting students' needs : choices of tasks, activities and resources
    - Students' attainment: how well they do in exams and classroom? students' progress and ability in learning.
    - Students' interact with others, social learning process, working collaboratively in groups.
    - Students' motivation, enthusiasm and attitude towards their education.

13. What are the needs of the teacher in IT? (probe: the training, the pedagogy, the curriculum, more time, more computers, the technical assistants, the software)

Focus Groups Questions for Students

1. Could everyone introduce themselves? (Ice-breaking session)

2. How long have you been learning in Smart School? Are there any differences between ordinary schools and Smart Schools in your opinion?

3. Can you tell me how this school changed after pronounced as Smart Schools for the last three years? How is it different now from the way it was before?

4. How things done now and what do you expect for the future?

5. What did you actually do differently in your studying as a result of these changes? (probe for positive and negative answers and questioning the reasons behind)

6. How do you react and respond to the Smart School's concept? (happy, afraid, interested to know, proud etc)

7. How far can students accept and adapt to the current school's change?

8. Do you think you can achieve you visions and goals in a Smart School?

9. What are students' attitudes towards Smart Schools and how this does affect their acceptance or rejection of Smart School? (probe for positive and negative answer). If negative attitudes then the researcher will ask for the reason behind:
    - Afraid of technology and computers
    - Comfortable with previous school
    - Fear of failure
    - Too much commitment and workload
    - Felt incompetent in computer skills

10. Do students have any problems and barriers in a Smart Schools?

11. Do you think that they are ready for increased-use of technology?

12. How good is your performance in this Smart School in this particular area?
    - content knowledge
    - computer's skill
    - motivation
    - mastery of subject matters

13. What do you think about Smart Schools' curriculum?
    - Knowledge acquisition, integration and balance
    - Analytical, creative thinking and the ability to make decisions and problems solving
    - IT competency
    - Proficiency in an international language
    - Inculcation of values towards the development of the good person.

14. What do you think about Smart Schools' teaching and learning processes?

- Self-accessed learning, self-directed learning and self-paced learning
- Quality of learning process: teacher-student dialogue, clarity of explanation and appropriate approaches
- Meeting students' needs : choices of tasks, activities and resources
- Students' attainment
- Students' social skills
- Students' motivation, enthusiasm and attitude towards their education.

15. What are the needs of students in IT? (probe: the training, the pedagogy, the curriculum, more time, more computers, the technical assistants, the software

Appendix 2: The Questionnaire for Survey Study

A- Questionnaire Design

There are three types of question in the questionnaire: attributes, attitudes and knowledge. Attribute questions were purposely designed to gather information about respondents' backgrounds and characteristics. Attitudinal questions focused on the teachers' and students' attitudes toward Smart Schools, their attitudes toward computer use in Smart Schools, the Smart Schools' curriculum and the Smart Schools' teaching and learning approach. Lastly, knowledge questions sought to understand respondents' needs for technology use in Smart Schools.

The questionnaire was divided into 7 sections from Section A to Section G. Section A was designed to gather information about personal background such as gender and school. It was also intended to seek knowledge about the relationship between respondents' personal background and their attitudes towards Smart Schools' initiative.

Even though there was no significant evidence found in focus group interviews regarding the relationship between gender and the level of ICT usage in Smart Schools, some literature shows that there were significant differences between gender and the daily use of the computer (Hayward 2002; Kent 2004) and confidence in using computer (Russell 1997; Murphy 1998). Murphy (1998) reports that there is significant evidence to show that women student teachers in PGCE and BEd during their initial teacher training were less confident than male students about using computers in teaching. In this research I wanted to know if there are any differences between genders and would these differences lead to different attitudes toward technology change in Smart Schools.

Kent (2004) showed that there are significant differences between gender in terms of the frequency of daily use of the computer in schools with more boys involved in a range of ICT and computer activities than girls. Even though it was difficult to say boys are more involved in computer use than girls based on focus groups data but I can sense the difference of computer activities between boys and girls in Smart Schools. Boys were more interested in "games playing" based on activities in which "we can fight and challenge the other friends", whereas girls were reported using computers for writing purposes and fun such "entertainment programs, listening to songs, artists".

I also wanted to know the differences between schools in using computers and how far these differences affect their attitudes toward Smart Schools. Data from focus group interviews suggest that there were differences between schools in using computers in the classrooms. Responses varied with some schools showed a very high computer use and some schools a very low. Students in a very high computer use school admitted that "computer use is more widespread" inside and outside classroom. In this school, some classes equipped with "computers inside the classroom" and outside the classroom students were actively organized and promoted ICT activities such "IT and Career Week" not only for their school but also for national level. Teachers in this school also incorporated their activities with ICT such as designing websites and Powerpoint for learning purposes.

However, in reality, not all the schools have the same ICT culture and practice. In some schools students admitted that they had not used the computers since last year and some schools use them only for certain subject with only certain classes having the privilege to go to the computer lab: "Only sciences classes like us get the priority to use it" and "the lower rank classes don't have that chance".

In this research, I also wanted to find out whether teachers' ages are linked with positive or negative attitudes regarding technology change in Smart Schools. I wanted to know simply because of their age, older teachers are less likely to engage with the ICT technology (Jones 2004). However, Murphy (1998) found that there was no significant effect of age on computer use among teachers' trainers in PGCE and BEd. I also want to know whether the teaching experience and the academic qualifications can contribute toward better attitudes regarding Smart School initiatives. Murphy (1998) concluded in his research that PGCE students were more confident in all aspects of computer use compared to BEd students because they had had more computer experience. Lee (1997) cited that many classrooms teachers of advanced age in the US schools were still lacked computer skills despite the advance ICT technology waves are making their ways into their classrooms.

Section B was designed to gather information about participants' background in computer use. Respondents were asked about the use of computers and internet in their home and in the Smart Schools. BECTA research on young people's use of computer found that the existence of a computer and the internet at home enhanced a child's perception of their computing skills (Hayward 2002). Even though, schools remained the main provider for the students to use computers in the UK, the parents believed that their child would achieve better results at school if they had access to a computer at home. On average, the students in UK spent around 10 hours using computers in the week and most of them at home (6 hours), at school (3 hours) and elsewhere (1 hour). Kent (2004) also found that there are differences between the use of computers at home and at schools among students. Computers activities at home tend to be associated with leisure such as games and media activities, whereas at schools the emphasis on learning resources. Students with computers at home use them more frequent at school compare to the students without computers at home. (Russell 1997) found that those who owned or had ready access to computers were had greater competency with computers.

I also wanted to investigate the training received by the students and teachers in Smart Schools as training affects attitudes toward computers and competency in using computers. In the focus group interviews, Islamic Education teachers complained about the lack of computer skills training. They said that they had not received any computer skills training as other teachers.

Russell (1997) found that teachers who had received computer training at university or through external agencies were more competent in using them at school. Inadequate and inappropriate training leads to insufficient confidence to make full use of the computers in and out of the classrooms (Jones 2004). Lee (1997) said that a great number of in-service teachers in US are not equipped with even basic computer operational skills. This is because many of them may not have had the opportunity to take a computer course while they were in teacher training. In Smart Schools, some of teachers began teaching "before there were any computers around" and therefore even "basic training" on computer operational skills "like how to open the programme" was very much appreciated.

Sections C to Section G in the questionnaires were designed to measure the attitudes of respondents and to understand their needs regarding the implementation of the Smart School initiative.

Section C was designed to explore respondents' attitudes towards educational change in Smart Schools. From the analysis of the Focus Groups data there appeared to be 3 levels of attitude: firstly, positive; secondly, negative and lastly, neutral. There were 11 questions for students in section C, questions C10 to C16 reflect a positive attitude towards Smart Schools, C17 shows neutral attitude, and C18-C20 reflect a negative attitude towards Smart Schools. There were 12 questions for teachers in this section, the positive attitude (C12 to C18), the neutral attitude (C19) and negative attitudes (C20-C23). Overall, there were more positive attitudes questions compare to the negative attitudes which parallel with the focus groups findings.

In focus groups, Islamic Education teachers said that they were "positive" and "welcoming" towards the Smart School initiative. According to the respondents, changes in education were needed because of "technology change". One student said "our country's using lots of computers so we don't want to feel left out". Participants want to move forward as "everybody is trying to improve themselves" and "loves to use better tools" in the classroom. With the existence of Smart School initiative, the participants have a chance to use computers and get training in computer literacy. Students said they felt "proud", "happy", "cool" and "grateful" because their schools had been chosen as Smart Schools. These students were interested in the prospect of using computers and new technology in schools. They think that the computer is very useful "for the future". Some students were confident that the Smart School project still can be successful in future.

The neutral reaction can be seen in some of the student attitudes toward Smart Schools. These students said that there was no difference between Smart Schools and other schools except more computers were provided. One student said "as students, we just follow" the orders and one teacher also admitted in Malaysian schools everything ordered by the authority must be done.

Negative attitudes towards Smart Schools in this questionnaire were based on the problems encountered in the process of the implementation of Smart Schools. The issue of overloaded work was the main concern for students in the focus group interview. Students complained of increasing workloads, lots of homework and packed schedules. Teachers were concerned and afraid of losing control in the classroom. It was difficult for the teachers to supervise students in the computer labs as they were frequently viewing other websites. Therefore, I wanted to know in this questionnaire whether the respondents more comfortable before or after there were Smart School.

Section D was designed to measure respondents' attitudes toward the use of computers in teaching and learning. I believe that the attitudes towards Smart School as an organization also contribute towards teachers' acceptance or resistance of new technology in schools. Schools need to change in order to respond to community needs for technology training and to fulfil their own needs to increase teaching and learning resources. I believe that the positive attitudes toward changes in Smart School initiatives in Section C are correlated with respondents' positive attitudes toward computers in Section D.

There were 18 questions for students (D21-D38) and 20 questions for teachers (D24-D43). One of the most important findings from the core category "Coping with the Use of Computers in Smart Schools" was the attitudes toward computer use itself and the cause of ICT in Smart Schools (Focus Groups: Attitudes toward Computer use, Causal Conditions of Computers and ICT). Attitudes towards computer have been discussed in the focus group data analysis which divided into positive attitudes and negative attitudes. The questions were also based on the causal conditions findings of these phenomena which concerned how the computer was being used for teaching and learning in Smart Schools. I also specifically asked respondents' opinion on the use of computers in Islamic Education.

Generally, in focus groups data, participants were very positive towards computers. Students were "enjoy", "exciting" and "like" to use computer. They admitted that computers enhance their "generic knowledge" and help them to "explore new things". Students said they were more creative when using computers and could "produce animated images". Working with computers was described as "easier", "neater" and "effective". Teachers admitted it was easy to prepare examinations questions because all previous questions had been stored in computer.

Islamic education teachers were interested to learn a lot about computer as they knew that a firm mastery of computers for teaching is a "challenge" for them nowadays. Student also agreed that a firm mastery of computers will help them in the future. I wanted to probe whether the respondents believe that computers will improve attainment and achievement in Smart Schools and would they prefer to use computers in teaching and learning. I also want to explore participants' attitudes towards computer use in Islamic Education.

The questionnaire also addressed some of the problems in using computers for teaching and learning in Smart Schools. These problems can be found in the intervening conditions analysis in the focus group data which I considered important to ask in the questionnaire. Focus group data shows that despite of their attractive image, computers also can distract students from learning. One student described computers as "full of fun" but distracting from learning. Teachers complained because it is difficult to supervise students while teaching using computer and also difficult for them to complete the syllabus if they teach using computer. Some of the students did not bother if their teachers teach using book rather than the computers.

Section E of the questionnaires is focussed on the curriculum in Smart Schools. I wanted to know the view of Islamic Education teachers on the concept of curriculum proposed in the blueprint of Smart Schools issued by the Ministry of Education (Malaysia 1997a; Malaysia 1997b; Malaysia 2003). The Ministry designed the curriculum to achieve the goals of National Philosophy of Education which is to achieve a balanced development of mind, emotion, spiritual and physical. The curriculum was designed to integrate knowledge, skills, values, and correct use of language across the curriculum. It was emphasized on knowledge acquisition and problem solving knowledge to help students to find solution in the subject matter. It emphasizes on skills such as ICT competency skills and decision-making skills. Values such as responsibility and sincerity were infused across the curriculum to be applied in the classroom.

Students involved in the focus group interviews agreed that the Smart School curriculum promotes knowledge acquisition, creative thinking, problem-solving, decision making and ICT competency among students. According to the students, they have gained "a lot of knowledge and information" on the subject matter and "generic knowledge" of other subjects. They said that the Smart School curriculum promotes creative thinking and by providing a "variety of learning sources" and learning activities also encourage them to "do different from others". Students mentioned that their computer skills enhance rapidly in Smart Schools.

Section F explores the attitudes of respondents toward the teaching and learning approach in Smart Schools. Smart School concept implies self-access to the relevant learning materials, self-directed to the topics of interest in learning and self-pace learning without being held back by slow learners. These approaches to learning are different from the common practice in other schools.

Students said in their focus group interviews that they were asked by their teachers to do "self-searching" for the relevant materials on the Internet. Students noticed that this "university" style of learning approach was different and require a big effort on their part. There was not much evidence that students are allowed to do self-pace and self-directed learning in which they can learn at their own pace or learn topics of interest without being tied down to a rigid curriculum. Teaching and learning is still very much dependant on the national syllabus in Smart Schools.

I found in the focus group data the positive reactions from the students who enjoy the classroom activities that involve lots of discussion and communication with teachers. They said classroom activities are more interesting when they are allowed to participate in the learning process. They are urged to work collaboratively in groups which make them interact better with others in the classroom. They admitted they are more motivated to learn compared to the previous approach to learning.

This section of the questionnaires also aimed to explore the respondents' progress in learning because there is not much evidence in the focus group data that the students made progress in learning even though many of them said that they are more motivated in learning. I also wanted to know whether the students attained better results in their exams because this appeared to be one of their main concerns.

Section G investigates the needs of respondents in ICT technology. This section tried to probe respondents' feelings about the need for more ICT resources, software and technical support. The questions mainly addressed the issue of the need for other subjects to be integrated with technology, the need to have more ICT resources for teaching and learning especially in Islamic Education which is still short of ICT teaching resources as mentioned by the teachers in the focus groups interview. The questions also raised the need for curricular-based and examination-based software. This is very important according to the teachers and the students alike. The questions also considered the issue of time, the need of more time to learn and to use the computers and the internet which was raised repeatedly by the focus groups.

B- Questionnaire for the Students

A : Students Background

Please tick (√) the appropriate box

1. Gender: ☐ M ☐ F

2. School : ____________________

3. How long have you been in this school?

☐ 0-1 years ☐ 2 years ☐ 3 years ☐ 4 years

B : Computers Background

4. Do you have access at home to:

i : a computer? ☐ Yes ☐ No

ii : the internet? ☐ Yes ☐ No

5. Have you received any computer training from the beginning of Smart School?

☐ Yes ☐ No

6. Did you receive any training on the following internet resources and computer programmes? Where? (Check all that apply).

Resourses and Programmes	**Never**	**Personal training**	**Peer Group Training**	**Parents training**	**Commercial training**	**In-house training**
Internet and World Wide Web						
School networking						
Internet conferencing (mIRC, MSN messenger)						
E-mail						
Word processing						
Databases (e.g Excel)						

Spreadsheets (e.g Access)						
Educational software						
Online information resources (e.g educational websites)						
Others (name it) :						

7. From the beginning at this Smart School, I use the computer :

☐ Daily

☐ Weekly

☐ Monthly

☐ Yearly

8. Currently I use the computer approximately _______ hours per week in the classroom

9. How often do you use the following internet resources and computer applications in your Smart School :

Resourses and Programmes	**Never**	**Daily**	**Weekly**	**Monthly**	**Semester**	**Yearly**
Internet and World Wide Web						
School networking						
Internet conferencing (mIRC, MSN Messenger)						
E-mail						
Word processing						
Databases (e.g Access)						
Spreadsheets (e.g Excel)						
Educational software						

Online information resources						
Others (name them) :						

C : Students' Attitudes Towards Educational Change in Smart Schools

1 = Strongly Disagree (SD) **2 = Disagree (D)** **3 = Undecided (U)**
4 = Agree (A) **5 = Strongly Agree (SA)**

	What do you think of Smart Schools?	**SD**	**D**	**U**	**A**	**SA**
10.	It is something that I really need	1	2	3	4	5
11.	It is a chance to get some training in computer literacy	1	2	3	4	5
12.	I like to get involved in Smart Schools' project	1	2	3	4	5
13.	It would be useful for me	1	2	3	4	5
14.	It is very interesting for me	1	2	3	4	5
15.	I believe Smart Schools will be successful	1	2	3	4	5
16.	It is a learning change that is worth a try	1	2	3	4	5
17.	I just do what teachers tell me to do	1	2	3	4	5
18.	I am afraid of appearing incompetent in the classroom	1	2	3	4	5
19.	I was more comfortable before we had Smart Schools	1	2	3	4	5
20.	There is too much work in Smart Schools	1	2	3	4	5

D : Students' Attitudes Towards Computers Technology

1 = Strongly Disagree (SD) **2 = Disagree (D)** **3 = Undecided (U)**
4 = Agree (A) **5 = Strongly Agree (SA)**

	What do you think of computer technology use	**SD**	**D**	**U**	**A**	**SA**
21.	I enjoy doing things on a computer	1	2	3	4	5
22.	I can learn many things when I use a computer	1	2	3	4	5

23.	Using a computer makes me feel more creative	1	2	3	4	5
24.	Computers help me learn better	1	2	3	4	5
25.	I easily get distracted from learning by computer	1	2	3	4	5
26.	Learning is more difficult while using computers	1	2	3	4	5
27.	It is difficult to complete the syllabus while using computers	1	2	3	4	5
28.	I feel lack of knowledge to use computers in the classroom	1	2	3	4	5
29.	I feel incompetent when using computers in the classroom	1	2	3	4	5
30.	I believe that I can learn more from books than from a computer	1	2	3	4	5
31.	Working with computers makes me feel isolated from my friends	1	2	3	4	5
32.	I need a firm mastery of computers for learning purposes	1	2	3	4	5
33.	If given the opportunity, I want to learn a lot about computers	1	2	3	4	5
34.	I prefer to use a computer in learning	1	2	3	4	5
35.	I believe computers will improve my attainment	1	2	3	4	5
36.	If there is a computer in my classroom it would help me to be a better students	1	2	3	4	5
37.	I believe that computers can be used successfully in Islamic Education	1	2	3	4	5
38.	I think students enjoy working with computers in Islamic education	1	2	3	4	5

E : Students' Attitudes Towards Smart Schools' Curriculum

1 = Strongly Disagree (SD) **2 = Disagree (D)** **3 = Undecided (U)**
4 = Agree (A) **5 = Strongly Agree (SA)**

	What do you think of the curriculum in Smart Schools?	SD	D	U	A	SA
39.	It emphasises on creative thinking	1	2	3	4	5
40.	It emphasises a balanced mental, emotional, spiritual and physical development	1	2	3	4	5

41.	It increases my generic knowledge	1	2	3	4	5
42.	It teaches me how to make decisions	1	2	3	4	5
43.	It teaches me how to solve problems	1	2	3	4	5
44.	It helps me better in computer	1	2	3	4	5
45.	It helps me to become proficient in an international language	1	2	3	4	5
46.	It develops good values	1	2	3	4	5
47.	I believe Smart School have produced a good curriculum	1	2	3	4	5
48.	I believe Smart School has produced good textbooks	1	2	3	4	5
49.	I prefer Smart School textbooks rather than national textbooks	1	2	3	4	5

F : Students' Attitudes Towards Smart Schools' Teaching and Learning Approach

1 = Strongly Disagree (SD) **2 = Disagree (D)** **3 = Undecided (U)**
4 = Agree (A) **5 = Strongly Agree (SA)**

What do you think of teaching and learning in Smart Schools?		**SD**	**D**	**U**	**A**	**SA**
50.	I can get access to the relevant learning materials	1	2	3	4	5
51.	I can easily access topics of interest to me	1	2	3	4	5
52.	I can learn at my own pace	1	2	3	4	5
53.	There are enough learning materials to help the students	1	2	3	4	5
54.	There are more two-way communications	1	2	3	4	5
55.	I enjoy learning in a Smart School	1	2	3	4	5
56.	Classroom activities are more interesting	1	2	3	4	5
57.	I feel more confident in exams now	1	2	3	4	5
58.	I have attained better exam results in a Smart School	1	2	3	4	5
59.	I have made significant progress in learning	1	2	3	4	5
60.	I can interact better with others	1	2	3	4	5
61.	I can work collaboratively in groups	1	2	3	4	5

		SD	D	U	A	SA
62.	I am more motivated towards learning	1	2	3	4	5

G : Students' Attitudes Towards The Use of Technology, Internet and Software

1 = Strongly Disagree (SD) **2 = Disagree (D)** **3 = Undecided (U)**
4 = Agree (A) **5 = Strongly Agree (SA)**

	Read the statement below and identify your needs in the use of technology, internet and software	**SD**	**D**	**U**	**A**	**SA**
63.	I would like more subjects that integrate technology	1	2	3	4	5
64.	I would like more IT resources to help me learn	1	2	3	4	5
65.	I would like to work with other students to become more proficient using technology	1	2	3	4	5
66.	I would like more time to learn how to use computers	1	2	3	4	5
67.	I would like more time to access the Internet	1	2	3	4	5
68.	I would like to explore technology in the classroom	1	2	3	4	5
69.	I would like more time to use computers in learning	1	2	3	4	5
70.	I would like more software that is curricular-based	1	2	3	4	5
71.	I would like more software that is examination-based	1	2	3	4	5
72.	I would like more technical support	1	2	3	4	5

73. Any resources, training and assistant needed, please write it down :

____

____

____

C-The Questionnaire for the Teacher

A : Teachers Background

Please tick (√) the appropriate box

1. Gender: ☐ Male ☐ Female

2. Age: ☐ 21-25 ☐ 26-30 ☐ 31-35
☐ 36-40 ☐ 41-45 ☐ 46 +

3. School : ____________________

4. How long have you been teaching?
☐ 0-1 years ☐ 2-5 years ☐ 6-10 years
☐ 11-15 years ☐ 15+ years

5. Highest academic qualification :
☐ Teaching Certificate
☐ Diploma in Education
☐ Bachelor's Degree
☐ Master Degree

B : Computers Background

6. Do you have access at home to:
i : a computer? ☐ Yes ☐ No
ii : the internet? ☐ Yes ☐ No

7. Have you received any training from the beginning of Smart Schools?
☐ Yes ☐ No

8. Have you received any training on the following internet resources and computers programmes? Where? (Check all that apply).

Resources and Programmes	Never	Personal training	Training with colleague	Commercial training	School training	Ministry training
Internet and World Wide Web						
School networking						
Internet conferencing (mIRC, MSN messenger)						
E-mail						
Word processing						
Databases (e.g Access)						
Spreadsheets (e.g Excel)						
Educational software						
Online information resources						
Others (name it) :						

9. From the beginning at this Smart School, I use the computer :

- ☐ Daily
- ☐ Weekly
- ☐ Monthly
- ☐ Yearly

10. Currently I use the computer approximately ______ hours per week in the classroom

11. How often do you use the following internet resources and computer programmes in this Smart School :

Resources and Programmes	Never	Daily	Weekly	Monthly	Semester	Yearly
Internet and World Wide Web						
School networking						
Internet conferencing (mIRC, MSN messenger)						
E-mail						
Word processing						
Databases (e.g Access)						
Spreadsheets (e.g Excel)						
Educational software						
Online information resources (e.g educational websites)						
Others (name it) :						

C : Teachers' Attitudes Towards Educational Change in Smart Schools

1 = Strongly Disagree (SD) **2 = Disagree (D)** **3 = Undecided (U)**
4 = Agree (A) **5 = Strongly Agree (SA)**

What do you think of Smart Schools?	**SD**	**D**	**U**	**A**	**SA**
12. It something that I really need	1	2	3	4	5
13. It is a chance to get some training in computer literacy	1	2	3	4	5
14. I like to get involve in the Smart Schools' project	1	2	3	4	5
15. It would be more useful for me	1	2	3	4	5
16. It is very interesting for me	1	2	3	4	5
17. I believe Smart School will be successful	1	2	3	4	5

18.	It is a teaching change that is worth a try	1	2	3	4	5
19.	I just do what principal tells me to do	1	2	3	4	5
20.	I am afraid of losing control in my class	1	2	3	4	5
21.	I felt more comfortable before we had Smart Schools	1	2	3	4	5
22.	I doubt I can fulfil the goals of Smart Schools	1	2	3	4	5
23.	There is too much work in Smart Schools	1	2	3	4	5

D : Teachers' Attitudes Towards Computers Technology

1 = Strongly Disagree (SD) **2 = Disagree (D)** **3 = Undecided (U)**
4 = Agree (A) **5 = Strongly Agree (SA)**

What do you think of computers technology use?		SD	D	U	A	SA
24.	I enjoy doing things on a computer	1	2	3	4	5
25.	I can learn many things when I use a computer	1	2	3	4	5
26.	Using a computer makes me feel more creative	1	2	3	4	5
27.	Computer cuts down my teaching preparation time	1	2	3	4	5
28.	It's easier to prepare examination questions	1	2	3	4	5
29.	Students easily get distracted by computers	1	2	3	4	5
30.	Teaching work is more difficult while using computers	1	2	3	4	5
31.	I think, it's difficult to complete the syllabus when I teach using the computer	1	2	3	4	5
32.	I feel a lack of knowledge to use computers in my classroom	1	2	3	4	5
33.	I'm not experienced in using computers in the classroom	1	2	3	4	5
34.	I am afraid of appearing incompetent in front of students in my classroom	1	2	3	4	5
35.	I believe that I can teach better using books than from a computer	1	2	3	4	5

36.	Working with computers makes me feel isolated	1	2	3	4	5
37.	I need a firm mastery of computers for teaching	1	2	3	4	5
38.	If given the opportunity, I want to learn a lot about computers	1	2	3	4	5
39.	I prefer to use computers in my teaching	1	2	3	4	5
40.	I believe computers will improve student achievement	1	2	3	4	5
41.	If there is a computer in my classroom it would help me to be a better teacher	1	2	3	4	5
42.	I believe that computers can be used successfully in Islamic Education	1	2	3	4	5
43.	I think students enjoy working with computers in Islamic Education	1	2	3	4	5

E : Teachers' Attitudes Towards Smart Schools' Curriculum

1 = Strongly Disagree (SD) **2 = Disagree (D)** **3 = Undecided (U)**
4 = Agree (A) **5 = Strongly Agree (SA)**

	What do you think of the curriculum in Smart School?	**SD**	**D**	**U**	**A**	**SA**
44.	It should emphasis on knowledge acquisition	1	2	3	4	5
45.	It should emphasise a balanced mental, emotional, spiritual and physical development	1	2	3	4	5
46.	It should develop creative thinking	1	2	3	4	5
47.	It should teach students how to make decisions	1	2	3	4	5
48.	It should teach students how to solve problems	1	2	3	4	5
49.	It should promote IT competency	1	2	3	4	5
50.	It should develop proficiency in an international language	1	2	3	4	5
51.	It should inculcate good values	1	2	3	4	5

F : Teachers' Attitudes Towards Smart Schools' Teaching and Learning Approach

1 = Strongly Disagree (SD) **2 = Disagree (D)** **3 = Undecided (U)**
4 = Agree (A) **5 = Strongly Agree (SA)**

What do you think of teaching and learning in Smart School		**SD**	**D**	**U**	**A**	**SA**
52.	Students easily get access to the relevant learning materials on the internet	1	2	3	4	5
53.	Students can easily access topics of interest without being tied down to a rigid curriculum	1	2	3	4	5
54.	Students can learn at their own pace without being held back by slower students	1	2	3	4	5
55.	There are enough learning materials to help the students	1	2	3	4	5
56.	There are more two way communications	1	2	3	4	5
57.	Teaching has met the students' needs	1	2	3	4	5
58.	Classroom activities are more interesting	1	2	3	4	5
59.	Teaching is more relevant to students' interest	1	2	3	4	5
60.	Students attain better results in exams	1	2	3	4	5
61.	Students made significant progress in learning	1	2	3	4	5
62.	Students interact better with others in classroom	1	2	3	4	5
63.	Students work collaboratively in groups	1	2	3	4	5
64.	Students are more motivated in learning	1	2	3	4	5

G : Teachers' Attitudes Towards The Use of Technology, Internet and Software

1 = Strongly Disagree (SD) **2 = Disagree (D)** **3 = Undecided (U)**
4 = Agree (A) **5 = Strongly Agree (SA)**

Read the statement below and identify your needs in the use of technology, internet and software		**SD**	**D**	**U**	**A**	**SA**
65.	Technology should integrate with Islamic education	1	2	3	4	5
66.	I would like more IT resources to help my teaching	1	2	3	4	5

67.	I would like more resources that illustrate how to integrate technology into the curriculum	1	2	3	4	5
68.	I would like to work with colleagues to become more proficient using technology	1	2	3	4	5
69.	I would like more time to learn to use computers	1	2	3	4	5
70.	I would like more time to access the Internet	1	2	3	4	5
71.	I would like to be able to try out technology-enhanced in my classroom	1	2	3	4	5
72.	I would like more time to incorporate technology in my classroom	1	2	3	4	5
73.	I would like more software that is curricular-based	1	2	3	4	5
74.	I would like more software that is examination-based	1	2	3	4	5
75.	I would like more technical support to keep the computers working	1	2	3	4	5

76. Any resources, training and assistant needed, please write it down :

Appendix 3: The In-depth Interview Questions and Procedures

A- The Sample Selection

An in-depth interviewing process was conducted to investigate further the findings from the survey and the focus groups. 11 respondents consisting of 6 Islamic Education teachers and 5 students volunteered to take part in this phase. I selected two teachers from the same school to take part in this interview. The reason was because I found that they had different and contradictory views in the earlier focus groups interview and I wanted to probe them further. The in-depth interview provided me an opportunity not only to explore an individual's opinion in depth, but also an opportunity to investigate and clarify any unexpected and contradictory results in focus group data and survey findings.

The Islamic Education teachers involved in this interview represented one of the three categories below:

1- Teachers who were involved with school administration: Deputy Headmaster or Head of Department. They normally involved in school planning and represent their schools in official training and meetings organized by Ministry of Education or other schools. Two teachers fell into this category. They provided me with valuable input on the Ministry's and schools' policies on Smart Schools.

2- Senior teachers in Islamic Education who have vast experience in teaching Islamic Education. They were also involved in Smart Schools' project from the beginning. Three teachers fell into this category.

3- An Islamic Education teacher who frequently uses ICT in classroom. This teacher was repeatedly mentioned by students in focus groups as an ICT literate teacher. I wanted to probe more about his views and experiences in teaching Islamic Education using ICT.

Five students were involved in the in-depth interviews which I conducted after-school time. Unlike the teacher respondents, I did not select the students because I did not know their background. The students involved in this interview were nominated in two ways:

1- Through nomination by their teachers. This was because of the difficulty of gaining access to the students during school time and the students only be reached through their teachers. There were 3 students nominated by their teachers.

2- Through nomination by their classmates. I had a chance to meet the students and asked them to nominate a representative. There were 2 students nominated by their peers in the classroom.

However, in order to nominate a representative, I asked the teachers and the students to consider these conditions below:

1- The representative should have been involved with Smart Schools from the beginning because it was essential for the respondent chosen in this stage of research to familiar with Smart Schools surroundings.

2- The representative should be articulate competent and able to express their views during interview.

3- The representative should be interested in taking part in this research and willing to cooperate with the researcher regarding the implementation of the Smart School initiative.

4- The representative should be free and available for interviews after school time.

The in-depth interviews in this study were conducted in five Smart Schools in two states: Selangor and Negeri Sembilan. The schools chosen in this interview were purposely selected and had different characteristics as below:

1- A standard day-school of a type which operates throughout Malaysia and is managed by the Ministry of Education.

2- A fully residential school of a type where excellent students, especially from rural areas, are selected by the Ministry of Education to receive education in a conducive school climate with updated facilities. The learning environment in these schools is organised and planned to ensure excellent outcomes in learning. This school aims to carry out a science-oriented secondary education programme to realise the demands of Government policy.

3- A specialist religious education school of a type which aims at producing students who adhere to Islamic values and master the Arabic language, Jawi and Quranic skills. This school is also managed by Ministry of Education and the students were selected from among the best students throughout Malaysia.

4- A single-sex school of a type which comprises all-girls or all-boys in one school. These schools are also managed and organized by the Ministry of Education.

5- One of the schools in this interview was categorized as a rural school which provided me with a different school environment.

B- The Questions for the Students

The questions posed to the students in the in-depth interview were:

1- What sort of training in the use of computers is provided by your school?

2- About 28% students who answered my questionnaire said they use computers every week. Do you think this is true? Why? Based on your experience, how many times a week do you use computers in Smart Schools?

3- When do you normally use computers? (probe: in the school's time or after the school's time or in the weekend)

4- What are you usually looking for while searching the Internet? (probe: learning materials, emails, chatting etc)

5- Do you think that you really can learn from computers? The data shows that 32% said they learn more from books than from a computer. 32% undecided and 36% disagree.

6- Do you think there is too much work in Smart Schools? (Contradictory results from the focus group finding)

7- Do you prefer Smart School textbooks or national textbooks? Why? (Contradictory results from the focus group finding)

8- How far have your teachers implemented the Smart School teaching and learning approach, by encouraging students to do self-access, self-directed learning and self-pace learning? (The data shows it happens. Is it true?)

9- What are the features and activities in educational software that can attract students's interest? How do you think that educational courseware will be able to encourage learning? Do you think that displaying visual media in the courseware such as pictures and video can make a significant contribution towards learning? Why? How? Do you think that students can learn from games? How?

10- What are the topics in Islamic, in your opinion, that are suitable to learn using computers and software?

C- The Questions for the Teachers

The questions posed to the teachers in the in-depth interview were:

1- About 40%-50% of the teachers in the survey study said they had never received any training on educational software training and spreadsheet. Why? What sort of training have Islamic Education teachers received so far in Smart Schools?

2- Less than 30% of the teachers in the questionnaire survey said they had received training in school. Do you think your school has provided enough training for Islamic Education teachers? (This question was posed specifically to Islamic Education teachers who were also the school's administrators)

3- What do you think are the main problems that prevent teachers from using computers? For example 45% of teachers said that they had never used educational software before. Why?

4- Teachers' attitudes toward computers were very positive (data from focus groups and questionnaire D24). However, some teachers were having difficulties in using computers in classroom. For example 50% never experienced in using computer in classroom, 40% felt lack of knowledge to use computers in the classroom, 32% afraid of being incompetent infront of classroom. Why?

5- Questions C12 to C18 show that teachers were very receptive to the Smart School idea. However, some of the teachers (27%) felt that they were more comfortable before Smart Schools. Is it because of work overload in Smart Schools? (40% said there is too much work in Smart Schools)

6- 90% of Islamic Education teachers agreed with the Smart School curriculum concept. Is there any specific need for Islamic Education?

7- How far have Islamic Education teachers implemented the Smart School teaching and learning approach by encouraging students to do self-access, self-directed learning and self-pace learning? (The questionnaire data shows it happens. Is this a true picture?)

8- What are the features and activities in educational software that your students like most? How do you think that educational courseware will be able to encourage learning? Do you think that displaying visual media in the courseware such as pictures and video can make a significant contribution towards learning? Why? How?

9- What are the learning activities that can be used while teaching Islamic Education using computers in the classroom? What are the topics in Islamic Education that are suitable to teach using computers?

Appendix 4: Applications and Permissions to do Research

1- Application Letter to the Sponsor

THE UNIVERSITY OF WARWICK

24 March 2003

Prof. Dato' Dr. Mohammed Noor Embi
Deputy Vice Chancellor
University Kebangsaan Malaysia
Bangi, Selangor,
Malaysia

Dear Sir,

Mr. Mohd Isa Hamzah ID 0232056

Mr. Mohd Isa Hamzah is currently studying for the PhD degree at this University and I am his supervisor. As part of his research, Mr. Hamzah will need to carry out data collection in Malaysia during the Summer of 2003. This work has been scheduled from 27th June 2003 to 27th August 2003.

This data collection is vital to the PhD thesis and I strongly support his application to your university regarding this matter. I hope we may count on your cooperation.

Many thanks in advance.

Yours faithfully,

David Wray
Institute of Education

Institute of Education
The University of Warwick
Coventry CV4 7AL United Kingdom
Tel: 02476 522057
Fax: 02476 524177
Email: d.j.wray@warwick.ac.uk

www.warwick.ac.uk

2- Approval Letter From National University of Malaysia (UKM)

اونيۏرسيتي كبڠسأن مليسيا
UNIVERSITI KEBANGSAAN MALAYSIA

UKM(PER)6438
2 Jun 2004

Encik Mohd Isa bin Hamzah
Institute of Education
University of Warwick
Coventry CV4 7AL
United Kingdom

Tuan,

Permohonan Pulang Ke Malaysia

Dengan hormatnya izinkan saya merujuk perkara di atas dan memaklumkan bahawa Mesyuarat Ad Hoc Jawatankuasa Cuti Belajar dan Biasiswa Universiti Kebangsaan Malaysia Bil. 2/2004 pada 20.4.2004 telah bersetuju memperakukan permohonan tuan untuk pulang ke Malaysia pada 1.6.2004 dengan bantuan tambang kapal terbang untuk membuat penyelidikan dan memungut data di sekolah-sekolah Bestari.

Sekian, terima kasih.

'PERKHIDMATAN BERKUALITI AMALAN MURNI'

Yang benar,

(ROHANI NORDIN)
Unit Latihan
Bahagian Sumber Manusia
b.p. Pendaftar

s.k. - Dekan
Fakulti Pendidikan, UKM

- Ketua
Jabatan Perkaedahan dan Amalan Pendidikan, F.Pendidikan, UKM

- Ketua Penolong Pendaftar
Bahagian Pengurusan Pentadbiran
(u.p.: En. Musa bin Zainal Abidin Othman)

- Ketua Penolong Bendahari
Jabatan Bendahari, UKM
(u.p. : Puan Hajah Mahani Abd. Rahman)
Sukacita puan mengambil tindakan ke atas perkara di atas.

- Fail edaran

Bahagian Sumber Manusia, Jabatan Pendaftar, UNIVERSITI KEBANGSAAN MALAYSIA, 43600 UKM Bangi Selangor D.E
Tel: 03 89215555, 03 89215008, 03 89215089 Faks: 03 89252882 Laman Web: www.ukm.my

QUALITY SYSTEM SIRIM
ISO/IEC GUIDE 62 : 1996 Accreditation No: QS 02121999 CB 01
MS ISO 9001 REG. NO. 2759

3- Approval Letter From Economic Planning Unit (EPU)

UNIT PERANCANG EKONOMI
Economic Planning Unit
JABATAN PERDANA MENTERI
Prime Minister's Department
BLOK B5 & B6,
PUSAT PENTADBIRAN KERAJAAN PERSEKUTUAN
62502 PUTRAJAYA,
MALAYSIA

Telefon: 88883333
Fax: 03-88883798

Ruj. Tuan:
Your Ref:

Ruj. Kami:
Our Ref: UPE: 40/200/19 SJ.1143

Tarikh:
Date: 09 Januari 2004

Mohd Isa Bin Hamzah
No. 12 Jalan 4/9 D,
Bandar Baru Bangi
43650 Bangi, Selangor
Email :

Tuan,

Permohonan Menjalankan Penyelidikan Di Malaysia

Merujuk kepada perkara di atas, sukacita dimaklumkan bahawa permohonan tuan bertarikh 10 Jun 2003 telah diluluskan oleh **Jawatankuasa Penggalakan dan Penyelarasan Penyelidikan Unit Perancang Ekonomi.**

2. Tuan dikehendaki datang ke pejabat ini untuk mendapatkan surat kebenaran menjalankan penyelidikan dengan membawa **dua keping gambar**. Sila ambil perhatian bahawa tuan dikehendaki mematuhi semua peraturan yang dikenakan oleh agensi-agensi yang berkaitan dengan kajian tuan.

3. Tuan juga dikehendaki menghantar ke pejabat ini sesalinan laporan awal sebaik saja tamat menjalankan penyelidikan dan laporan akhir/thesis apabila siap sepenuhnya. Tuan adalah bertanggungjawab menghantar sesalinan thesis atau lain-lain penerbitan yang dihasilkan daripada penyelidikan ini kepada semua agensi yang terlibat di dalam kajian tuan.

Perhatian

Surat ini adalah untuk makluman mengenai kedudukan permohonan penyelidikan tuan dan tidak boleh digunakan sebagai pas penyelidikan.

Sekian terima kasih

" BERKHIDMAT UNTUK NEGARA "

Saya yang menurut perintah,

(AHMAD MOKTHAR B. SHAHUL HAMID)
bp. Ketua Pengarah,
Unit Perancang Ekonomi,
(Seksyen Ekonomi Makro & Penilaian)
E.mail: akhtar@epu.jpm.my

UNIT PERANCANG EKONOMI
Economic Planning Unit
JABATAN PERDANA MENTERI
Prime Minister's Department
BLOK B5 & B6,
PUSAT PENTADBIRAN KERAJAAN PERSEKUTUAN
62502 PUTRAJAYA,
MALAYSIA

Telefon: 88883333
Fax: 603-88883798

Ruj. Tuan:
Your Ref:

Ruj. Kami: UPE: 40/200/19 SJ. 1143
Our Ref:

Tarikh: 30 Jun 2004
Date:

Pengarah,
Jabatan Pendidikan Negeri Sembilan
Jalan Dato' Hamzah
70604 Seremban, Negeri Sembilan.

Tuan,

PERMOHONAN UNTUK MENJALANKAN PENYELIDIKAN DI MALAYSIA

Dengan hormatnya dimaklumkan bahawa **Unit** ini telah menerima permohonan daripada **Encik Mohd Isa Bin Hamzah** warganegara **Malaysia** untuk menjalankan penyelidikan bertajuk **"Teacher' and Students' Needs In Developing An Instruction Design For Islamic Education Courseware In Malaysian Smart Schools".**

2. Bersama-sama ini disertakan satu salinan borang permohonan penyelidikan dan kertas cadangan kajian untuk rujukan tuan. Sukacita sekiranya pihak tuan dapat memberi pandangan terhadap cadangan kajian itu khususnya dari segi:

i) bidang yang akan dikaji,
ii) kawasan-kawasan kajian yang telah dikenalpasti; dan
iii) faedah-faedah yang mungkin dapat diperolehi dari kajian ini.

3. Memandangkan penyelidik ini mempunyai peruntukan kewangan dan masa yang terhad, kerjasama tuan dalam mempercepatkan ulasan ke atas cadangan kajian ini adalah dialu-alukan. Untuk makluman tuan ulasan ini perlu dikemukakan ke Unit ini dalam tempoh dua minggu dari tarikh penerimaan surat ini sepertimana yang telah diperuntukkan di bawah ***perkara 7.6.3 Pekeliling Am Bil. 3 Tahun 1999.*** Penyelidik ini juga telah dibuat tapisan keselamatan oleh Unit ini.

4. Kerjasama yang pihak tuan berikan didahului dengan ucapan terima kasih. Sekian.

" BERKHIDMAT UNTUK NEGARA "

Saya yang menurut perintah,

(RODUAN MOHAMAD NOR)
b.p. Ketua Pengarah,
Unit Perancang Ekonomi,
(Seksyen Ekonomi Makro & Penilaian)
E-mail: roduan@epu.my
Tel: 88882827/88882818

s.k.

Setiausaha Kerajaan Selangor,
Unit Perancang & Pembangunan Negeri,
Pejabat Setiausaha Kerajaan,
Selangor Darul Ehsan,
Tingkat 16,
Bangunan Sultan Salahuddin Abdul Aziz Shah,
40000 Shah Alam, Selangor.

Ketua Setiausaha,
Kementerian Pendidikan Malaysia,
Bahagian Perancangan & Penyelidikan Dasar Pendidikan,
Paras 2,3 & 5, Blok J,
Pusat Bandar Damansara,
50604 Kuala Lumpur.

Pengarah,
Pusat Pengurusan Penyelidikan,
Universiti Kebangsaan Malaysia,
43600 UKM, Bangi, Selangor.
(u/p: Prof. Dr. Muhammad Yahaya)

Pengarah,
Jabatan Pendidikan Selangor
Jalan Jambu Bol 4/3E
40604 Shah Alam, Selangor

Pengarah,
Jabatan Pendidikan Wilayah Persekutuan
Tkt 1, Blok B, Bangunan Anjung FELDA
Jalan Maktab, Off Jalan Semarak
50604 Kuala Lumpur.

4- Approval Letter From Ministry of Education (MoE)

KEMENTERIAN PENDIDIKAN MALAYSIA
BAHAGIAN PERANCANGAN DAN PENYELIDIKAN DASAR PENDIDIKAN
PARAS 2, 3 DAN 5, BLOK J
PUSAT BANDAR DAMANSARA
50604 KUALA LUMPUR
MALAYSIA

Telefon : 03-20986900
Faks : 03-20954960
Laman Web : http://161.142.144.5

Rujukan Kami : KP (BPPP) 603/008( )
Tarikh : 13 November 2003

Ketua Pengarah,
Unit Perancang Ekonomi,
Jabatan Perdana Menteri,
Blok B5 dan B6,
Kompleks Jabatan Perdana Menteri,
Pusat Pentadbiran Kerajaan Persekutuan,
62502 PUTRAJAYA.
(U/P : Ahmad Mokhtar bin Shahul Hamid)

Tuan,

Permohonan Untuk Menjalankan Penyelidikan di Malaysia
EN. MOHD ISA BIN HAMZAH

Dengan segala hormatnya saya merujuk kepada perkara di atas dan surat tuan bertarikh 12 November 2003 adalah berkaitan.

2. Adalah saya diarah memaklumkan bahawa Bahagian ini tidak mempunyai apa-apa halangan dan menyokong penuh ke atas cadangan yang dikemukakan kepada penyelidik berkenaan untuk membolehkan menjalankan penyelidikan. Walau bagaimanapun, kebenaran bagi menggunakan sampel kajian perlu diperolehi daripada **Pengarah Pendidikan Negeri yang berkenaan.**

3. Setelah selesai kajian dijalankan, pihak penyelidik perlulah mengemukakan senaskah laporan lengkap dapatan kajian ke Bahagian ini.

4. Bersama-sama ini disertakan ulasan Bahagian ini ke atas kertas cadangan penyelidikan yang dikemukakan.

Sekian dimaklumkan, terima kasih.

"BERKHIDMAT UNTUK NEGARA"

Saya yang menurut perintah,

(Dr. Mohd. Safiandri Gani bin Hj. Hamzah)
b.p. Pengarah
Bahagian Perancangan dan Penyelidikan Dasar Pendidikan
Kementerian Pendidikan Malaysia.

Ulasan dan Pandangan Kementerian Pendidikan

Nama Penyelidik : Encik Mohd Isa bin Hamzah

Tajuk Penyelidikan : Teachers' And Students' Needs In Developing An Instructional Design For Islamic Education Courseware In Malaysian Smart Schools

Nama Institusi : Warwick University, UK.

Peringkat Penyelidikan : Ph.D

i. Bidang yang dikaji : Sesuai

ii. Kawasan-kawasan kajian yang telah dikenalpasti : Sesuai

iii. Faedah- faedah yang mungkin dapat diperolehi dari kajian ini : Berfaedah kepada Kementerian Pendidikan Malaysia

(TN HJ. MOHD YUNUS BIN IBRAHIM)
Unit Penyelidikan Dasar
Bahagian Perancangan dan Penyelidikan Dasar Pendidikan
Kementerian Pendidikan Malaysia

Tarikh : 13 November 2003

5- Approval Letter From Economic Planning Unit of Selangor

SEKSYEN EKONOMI MAKRO,
UNIT PERANCANG EKONOMI NEGERI,
PEJABAT SETIAUSAHA KERAJAAN NEGERI
SELANGOR DARUL EHSAN,
TINGKAT 5,
BANGUNAN SULTAN SALAHUDDIN ABDUL AZIZ SHAH,
40000 SHAH ALAM

Telefon : 03-5544 7118 / 7136 / 7633 / 7947 / 7948 / 7949 / 7950
No. Faks : 03-5544 7963 / 03-5511 1981

Ruj. Tuan :

Ruj. Kami : (48) dlm.IPK.Sel. 04.05.1 / 70.97

Tarikh : 20 November 2003

SEGERA DENGAN FAKS

Pengarah,
Unit Perancang Ekonomi,
Blok B5 & B6, Jabatan Perdana Menteri,
Pusat Pentadbiran Kerajaan Persekutuan,
62502 PUTRAJAYA
(u/p : Ahmad Mokhtar Bin Shahul Hamid)
Tel : 03-8888 3333 Faks : 8888 3798

Tuan,

PERMOHONAN UNTUK MENJALANKAN PENYELIDIKAN DI MALAYSIA

Dengan hormatnya saya diarah merujuk kepada surat tuan UPE:40/200/19.SJ.1143 bertarikh 7 November 2003 mengenai perkara diatas.

2. Berhubung permohonan daripada **Mohd. Isa Bin Hamzah** warganegara **Malaysia** untuk menjalankan penyelidikan yang bertajuk ; **"Teachers' And Students' Needs In Developing An Instructional Design For Islamic Education Courseware In Malaysian Smart School".** Sukacita dimaklumkan bahawa Pentadbiran ini tiada halangan untuk beliau menjalankan penyelidikan berkenaan di Malaysia dengan syarat mematuhi prosedur yang ditetapkan.

3. Pentadbiran ini juga berharap supaya pihak pengkaji dapat mengemukakan satu salinan hasil kajian berkenaan samada dalam bentuk 'hardcopy atau 'softcopy' ke Pentadbiran ini untuk tindakan lanjut.

Sekian, terima kasih.

"BERKHIDMAT UNTUK NEGARA"

Saya yang menurut perintah,

(SAMAUN BIN ISHAK)
Seksyen Ekonomi Makro,
Unit Perancang Ekonomi Negeri
b.p Setiausaha Kerajaan Negeri Selangor
Tel : 03-5544 7118 / 7947 Faks : 03-5511 1981

6- Approval Letter From Selangor State Department of Education

جابتن فنديديقن سلاغور

JABATAN PENDIDIKAN SELANGOR
Jalan Jambu Bol 4/3E,
Seksyen 4,
40604 Shah Alam,
Selangor.

Telefon : 03 5518 6500
Fax : 03 5510 2133

Ruj. Tuan:

JPNS/SPS/PPN/A25090/06/
25 (28) Jld.3

Tarikh:
04 Disember 2003
10 Syawal 1424H

En. Ahmad Mokhtar bin Shahul Hamid
Unit Perancang Ekonomi,
Jabatan Perdana Menteri,
Blok B5 & B6,
Pusat Pentadbiran Kerajaan Persekutuan,
62502 Putrajaya Malaysia.

Tuan / Puan,

Kebenaran Menjalankan Penyelidikan / Kajian Di Sekolah – Sekolah Selangor
" Teachers And Students Needs In Developing An Instructional Design For Islamic Education Courseware In Malaysian Smart Schools "

Saya dengan hormat dan sukacitanya merujuk kepada perkara di atas.

2. Jabatan ini tiada halangan untuk pihak tuan/puan menjalankan kajian/penyelidikan tersebut di sekolah – sekolah dalam negeri Selangor seperti yang dinyatakan dalam permohonan.

Nama pemohon : En. Mohd Isa bin Hamzah

3. Pihak Tuan/Puan diingatkan supaya mendapat persetujuan daripada Pengetua/ Guru Besar sekolah berkenaan supaya beliau dapat bekerjasama dan seterusnya memastikan bahawa kajian yang dijalankan hanya bertujuan seperti yang dipohon.Kajian / Penyelidikan yang dijalankan juga tidak mengganggu perjalanan sekolah serta tidak mengandungi unsur – unsur paksaan.

4. Tuan/ Puan juga diminta menghantar senaskah hasil kajian ke Unit Perhubungan & Pendaftaran sebaik sahaja selesai penyelidikan / kajian .

Sekian, terima kasih.

"BERKHIDMAT UNTUK NEGARA"

Saya yang menurut perintah,

(MARIAH BINTI MAHAT)
Penolong Pendaftar Sekolah-Sekolah Selangor.

s.k. 1. Fail timbul

(Sila catatkan rujukan Jabatan ini apabila berhubung)

7- Approval Letter From Negeri Sembilan State Department of Education

جابتن ڤنديديقن نكري سمبيلن دارالخصوص

JABATAN PENDIDIKAN
NEGERI SEMBILAN DARUL KHUSUS
JALAN DATO' HAMZAH
KARUNG BERKUNCI No. 6
70990 SEREMBAN

Tel : 06-7653100
Fax : 06-7639969

Ruj. Tuan :

Ruj. Kami : JPNS(PPS)2/4/2/1 Jld. 1(41)

Tarikh : 11 Ogos 2004

En. Mohd Isa bin Hamzah
No. 1259 Taman Marida
Senawang 70450 Seremban
NEGERI SEMBILAN DARUL KHUSUS.

Tuan/Puan,

Kebenaran Menjalankan Kajian Ke Sekolah-Sekolah Di Negeri Sembilan Darul Khusus Di Bawah Kementerian Pendidikan Malaysia

Adalah saya dengan hormatnya di arah memaklumkan bahawa permohonan tuan/puan untuk menjalankan kajian bertajuk:-

" Teachers' And Students' Needs In Developing an Instructional Design For Islamic Education Courseware In Malaysian Smart Schools "

telah diluluskan.

2. Tuan/Puan hendaklah berjumpa terus dengan Pengetua/Guru Besar sekolah berkenaan untuk meminta persetujuan dan membincangkan kajian tersebut seperti berikut :-

i) **Sekolah Datuk Abdul Razak 70400 Seremban**
ii) **Kolej Tunku Khurshiah 70400 Seremban**
iii) **SM Agama Persekutuan Labu 71900 Labu**
iv) **SMK Dato' Sedia Raja 71300 Rembau**
v) **SM Sains Tuanku Jaafar 72000 Kuala Pilah**

3. Dimaklumkan bahawa kebenaran ini diberi berdasarkan surat kelulusan dari pihak Kementerian Pendidikan Malaysia, Bahagian Perancangan Dan Penyelidikan Dasar Pendidikan, nombor rujukan KP(BPPP)603/008( ) bertarikh 13 November 2003.

4. Tuan/Puan hendaklah menghantar satu naskah hasil kajian ke Jabatan Pendidikan Negeri Sembilan (u.p: Unit Perhubungan, Pendaftaran & Pendidikan Swasta).

...2/-

2

- 2 -

Sekian untuk makluman dan tindakan tuan/puan selanjutnya.

Terima kasih.

"BERKHIDMAT UNTUK NEGARA"

Saya yang menurut perintah,

(HAJI OTHAMAN BIN HAJI ISMAIL)
Ketua Sektor Pengurusan Sekolah
b.p Pengarah Pelajaran
Negeri Sembilan Darul Khusus

S.k. Pengetua/Guru Besar sekolah berkenaan.

Nota: - Sila beri satu salinan surat kelulusan semasa membuat kajian di sekolah.

mr/kajian

Appendix 5: Initial Data Analysis

1 Reliability Test

According to Field (2005) the reliability test is needed to test the reliability of the questionnaire. Reliability testing is necessary to ensure that the scale consistently reflects the construct it is measuring. A value of 0.7 to 0.8 is an acceptable value for Cronbach's Alpha and above 0.8 is considered a good value.

The reliability test for the students showed that Section D: Students' Attitudes toward Computer Use scored the highest value of Cronbach's Alpha (.837). The second highest value (.826) was recorded by Section F: Students' Attitudes toward Smart Schools' Teaching and Learning Approach. The third highest value (.789) was scored by Section G: Students' Attitudes toward The Needs of Technology, Internet and Software. The fourth highest value (.758) was scored by Section E: Students' Attitudes toward Smart Schools' Curriculum. The only section which scored below 0.7 was Section C: Students' Attitudes toward Educational Change in Smart Schools which scored 0.696. However, if we round-up the figure then we can get 0.7 which is an acceptable value for Cronbach's Alpha test. The table below showed the summary of Cronbach's Alpha test results and a more detailed of Cronbach's Alpha analysis can be found in the Appendix table.

Table: Reliability Test for Students Data

Constructs	Cronbach's Alpha	Number of Items
C: Students' Attitudes toward Educational Change in Smart Schools	.696	11
D: Students' Attitudes towards Computer Use	.837	18
E: Students' Attitudes toward the Smart Schools' Curriculum	.758	11
F: Students' Attitudes toward the Smart Schools' Teaching and Learning Approach	.826	13
G: Students' Attitudes Toward The Needs of Technology, Internet and Software	.789	10

The reliability test for the teachers' data showed that all sections in the teachers' questionnaire had enjoyed good Cronbach's Alpha value. The highest value of Conbach's Alpha (.940) shown by Section G: Students' Attitudes toward The Needs of Technology, Internet and Software. The second highest value (.937) was scored by Section F: Teachers' Attitudes toward Smart Schools' Teaching and Learning Approach. The third highest value (.924) was scored by Section E: Teachers' Attitudes toward Smart Schools' Curriculum. The fourth highest value (.871) was scored by Section D: Teachers' Attitudes towards Computer Use. The lowest value of Cronbach's Alpha recorded in the teachers data was .742 by Section C: Students' Attitude towards Educational Change in Smart Schools.

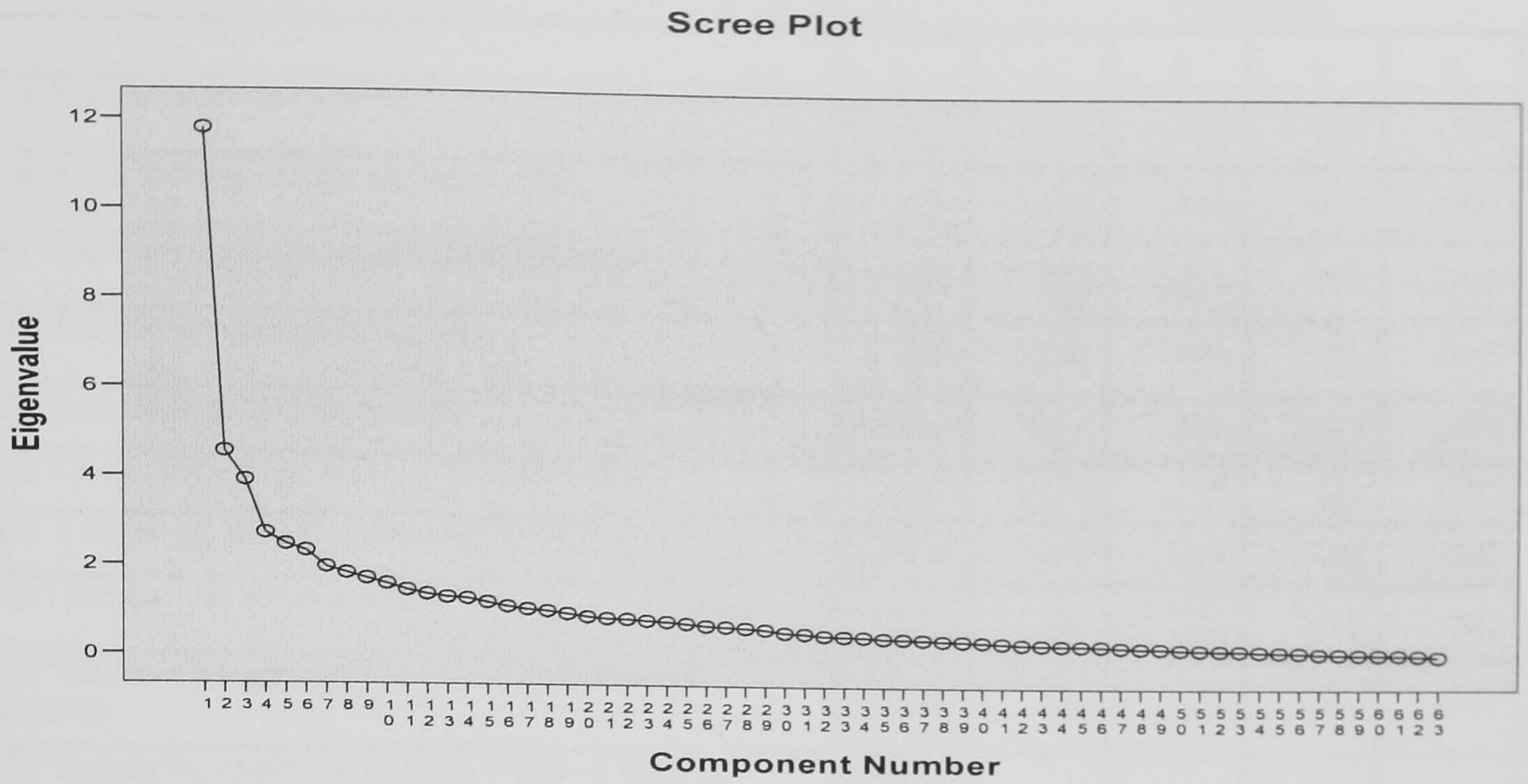
Table: Reliability Test for Teachers Data

Constructs	Cronbach's Alpha	Number of Items
C Teachers' Attitudes toward Educational Change in Smart Schools	.742	12
D: Teachers' Attitudes towards Computer Use	.871	20
E: Teachers' Attitudes toward the Smart Schools' Curriculum	.924	8
F: Teachers' Attitudes toward the Smart Schools' Teaching and Learning Approach	.937	13
G: Teachers' Attitudes Toward The Needs of Technology, Internet and Software	.940	11

2 Factor Analysis

According to Field (2005) factor analysis is used to validate the construct of questionnaire. Factor analysis can be used to validate a construct by demonstrating the items load on the same factor and dropping the items that cross-load into more than one factor. This can be done by simplifying a complex set of data and analyzing the correlations between them. In this study, six factors emerged based on the point of inflexion on the curve of the scree plot shown below.

Figure 1: Scree Plot



KMO and Bartlett's test showed there were patterns of correlations in the data that indicated the factor analysis was suitable to use. According to Field (2005), Kaiser suggests a bare minimum of 0.5. Values in between 0.5 to 0.7 are mediocre, 0.7 to 0.8 are good, 0.8 to 0.9 are great and values above 0.9 are superb. Based on this KMO result (.79) this data was suitable and could be used for factor analysis test.

Table: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.785
Bartlett's Test of Sphericity	Approx. Chi-Square	12561.721
	df	1953
	Sig.	.000

Initial data analysis showed that there were many items loaded into the 1st factor and in some of the items it was very difficult to determine which factors belonged to which. The value shown in the Component Matrix table (see Appendix) for the items was quite similar between two or more factors. I tried to distribute the items equally between six factors by using Varimax rotation and Direct Oblimin rotation (100 Iteration Convergence). The output showed that the items were more equally distributed into six factors (see Table below). However, I found that the result was very difficult to interpret and I decided to use the original construct.

Factor Analysis Using Direct Oblimin 100 Iteration fo Convergence

Pattern Matrix(a)

	Component					
	1	2	3	4	5	6
c14 It is very interesting for me	.675	.018	-.115	.016	-.254	.153
c16 It is a learning change that worth a try	.589	-.191	.193	.011	.121	.333
f54 There are more two way communications	.583	.123	-.013	.180	-.077	-.221
c13 It would be more useful for me	.566	-.034	-.075	.233	-.056	.096
c10 It something that I really need	.544	.093	.092	-.013	-.049	.063
c12 I like to get involve in Smart Schools' project	.530	-.032	-.050	.222	-.151	-.021
e44 It helps me better in computer	.475	.012	-.104	.035	-.220	.246
f52 I can learn at my own pace	.472	.324	4.83E-005	.073	.023	-.127
f53 There are enough learning materials to help the students	.454	.306	-.152	.264	.011	-.123
d33 If given the opportunity, I want to learn a lot about computers	.454	.119	.093	-.172	-.044	.300
c15 I believe Smart Schools will be successful	.385	.028	.096	.238	-.088	-.119
c11 It is a chance to get some training in computer literacy	.325	.039	.064	.151	-.181	.193
d26 Learning is more difficult while using computers	.196	.661	.034	-.025	.097	.198
d25 I easily get distracted from learning by computer	.194	.552	.017	-.021	.078	.121
d29 I feel incompetent when using computers in the classroom	-.188	.532	-.103	.234	.163	.312
d27 It is difficult to complete the syllabus while using computers	-.003	.521	.201	.006	.001	.121
f50 I can get access to the relevant learning materials	.221	.491	-.161	.020	-.208	-.032
f51 I can easily get access topics of my interest	.322	.462	-.119	.029	-.144	-.051
d28 I feel lack of knowledge to use computer in the classroom	-.303	.439	-.248	.266	.026	.306
d34 I prefer to use computer in learning	.219	.337	.127	-.152	-.299	.223
d32 I need a firm mastery of computers for learning purposes	-.052	.321	.151	.099	-.154	-.125
c19 I had more comfortable before we had Smart School	-.086	.260	.169	.218	-.218	.094
e45 It's develop me to profient in an international language	.158	-.239	-.068	.228	-.193	.165
g69 I would like more time to use computer in learning	.117	-.098	.697	-.048	-.030	-.041
g72 I would like more technical support	-.002	.039	.667	.017	-.069	-.067
g67 I would like more time to access the Internet	-.104	-.096	.653	.066	-.093	-.025
g70 I would like more software that is curricular-based	.102	.324	.635	.156	.179	-.064
g71 I would like more software that is examination-based	.102	.368	.630	.099	.155	-.024
g66 I would like more time to learn how to use computers	-.052	-.238	.605	-.018	-.147	.070
f58 I have attained better exam result in Smart School	-.286	-.025	.079	.739	-.131	.154
f57 I feel more confident in exam now	-.113	.069	.014	.737	.172	.021

f59 I have made a significant progress in learning	-.070	.128	.059	.719	-.098	-.062
e47 I believe Smart School has produced a good curriculum	.279	-.105	.117	.618	-.032	.004
e48 I believe Smart School has produced a good textbook	.227	-.003	.110	.523	-.023	.035
f60 I can interact better with others	.198	-.080	-.075	.501	-.135	.006
f55 I enjoy learning in Smart School	.203	.224	.012	.482	-.057	.011
f61 I can work collaboratively in groups	.162	-.130	.009	.466	-.269	-.074
f62 I am more motivated towards learning	.202	-.133	.142	.447	-.172	-.026
e46 It's develop good values	.278	-.213	.195	.446	-.128	.014
f56 Classroom activities are more interesting	.199	.045	-.072	.432	.029	.014
e49 I prefer Smart Schools' textbook rather than national textbook	-.017	-.070	.005	-.428	.171	.216
c18 I am afraid of appearing incompetent in the classroom	-.029	.267	-.139	.346	.118	.215
e43 It teach me how to solve problems	.090	-.118	-.069	.201	-.712	-.045
e42 It teach me how to make decisions	.052	-.251	.011	.184	-.671	-.012
e41 It's increase my generic knowledge	.247	-.227	.031	.104	-.550	.157
d38 I think students are more enjoyable working with computers in Islamic Education	.115	.180	.135	-.009	-.539	-.034
e39 It emphasis on creative thinking	.270	-.071	-.053	.198	-.532	.130
d36 If there is a computer in my classroom it would help me to be a better students	-.082	.283	.340	.034	-.511	-.025
d37 I believe that computers can be used successfully in Islamic Education subject	.122	.236	.176	-.033	-.509	-.051
e40 It emphasis on balance development of my mind, emotion, spiritual and physical	.153	-.137	.077	.244	-.459	-.077
d30 I believe that I can learn more from books than from a computer	-.055	.329	.078	-.027	-.441	.064
d35 I believe computers will improve my attaintment	-.025	.328	.274	.052	-.426	.132
g64 I would like more IT resources to help me learning	-.185	.206	.363	-.033	-.405	.233
d23 Using a computer makes me feel more creative	-.319	.293	-.110	.122	-.384	.319
d24 Computers help me learn better	-.024	.010	-.122	.057	-.077	.679
d31 Working with computers makes me feel isolated from my friends	.195	-.038	-.005	.201	.195	.652
g68 I would like to explore technology in classroom	.059	.082	.153	-.261	-.094	.532
d22 I can learn many things when I use a computer	-.082	.199	-.318	.087	-.263	.518
d21 I enjoy doing things on a computer	.100	.129	-.286	-.118	-.246	.496
c20 There is too much work in Smart School	.303	.063	.043	.053	.278	.480
g65 I would like to work with other students to become more proficient using technology	-.085	.012	.329	-.038	-.143	.387
g63 I would like more subjects that integrates technology	.095	.232	.233	-.143	-.268	.341
c17 I just do what teachers told me to do	-.134	-.287	.210	.203	.227	.294

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
a Rotation converged in 61 iterations.

Appendix 6: Comparing Means

1- The overall means of T-test to investigate the Differences between Genders toward the Attitudes of Islamic Education Students

Group Statistics

	A1 Gender	N	Mean	Std. Deviation	Std. Error Mean
C Attitude towards Smart Schools	1.00 Male	159	3.9365	.54216	.04300
	2.00 Femal	206	3.8058	.47285	.03295
D Attitude towards Computer Use	1.00 Male	159	3.8679	.53268	.04224
	2.00 Femal	206	3.7554	.51866	.03614
E Attitude towards Curriculum	1.00 Male	159	3.7233	.53032	.04206
	2.00 Femal	206	3.7476	.48028	.03346
F Attitude towards Teaching and Learni	1.00 Male	159	3.8108	.59097	.04687
	2.00 Femal	206	3.7207	.47969	.03342
G Technology Need	1.00 Male	159	3.9623	.49063	.03891
	2.00 Femal	206	3.9024	.60352	.04205

2- The overall means of T-test to investigate the Differences between Trained Teachers and Untrained Teachers and their Attitudes towards Smart Schools

Group Statistics

	B5 Have you rec any computer tra	N	Mean	td. Deviatio	Std. Error Mean
C Attitude toward Smart Schools	1.00 Yes	169	4.0032	.50117	.03855
	2.00 No	196	3.7417	.48255	.03447
D Attitude toward Computer Use	1.00 Yes	169	3.9343	.48427	.03725
	2.00 No	196	3.6925	.53785	.03842
E Attitude toward Curriculum	1.00 Yes	169	3.8015	.49143	.03780
	2.00 No	196	3.6814	.50583	.03613
F Attitude toward Teaching and Lea	1.00 Yes	169	3.8675	.54850	.04219
	2.00 No	196	3.6672	.50074	.03577
G Technology Ne	1.00 Yes	169	3.8941	.57494	.04423
	2.00 No	196	3.9582	.54121	.03866

3- The overall means of One-way ANOVA test to investigate the Differences of Attitudes between Smart Schools

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
Attitude towards Smart Schools	PJ	30	3.6970	.48654	.08883	3.5153	3.8786	2.55	4.64
	AS	30	3.9848	.57152	.10434	3.7714	4.1983	2.64	4.64
	SP	28	3.9610	.42383	.08010	3.7967	4.1254	3.27	4.91
	KI	31	3.9736	.52339	.09400	3.7816	4.1656	2.64	4.91
	TK	30	3.7424	.40310	.07360	3.5919	3.8929	2.91	4.45
	SR	21	3.9351	.49722	.10850	3.7087	4.1614	3.09	4.73
	DR	42	3.9134	.45029	.06948	3.7731	4.0537	2.55	4.55
	TD	32	3.6591	.66444	.11746	3.4195	3.8986	2.18	4.64
	KJ	31	3.8152	.43818	.07870	3.6545	3.9760	2.91	4.55
	BB	30	3.8152	.47116	.08602	3.6392	3.9911	2.55	4.55
	LB	31	3.8416	.58680	.10539	3.6264	4.0569	2.55	4.91
	TJ	29	4.0408	.43299	.08040	3.8761	4.2055	3.27	4.91
	Total	365	3.8628	.50767	.02657	3.8105	3.9150	2.18	4.91
Attitude towards Computer Use	PJ	30	3.5833	.42629	.07783	3.4242	3.7425	2.89	4.61
	AS	30	3.8222	.59789	.10916	3.5990	4.0455	2.33	4.89
	SP	28	4.0476	.53644	.10138	3.8396	4.2556	2.78	5.00
	KI	31	3.8262	.46031	.08267	3.6573	3.9950	2.89	4.89
	TK	30	3.8870	.56627	.10339	3.6756	4.0985	2.72	4.67
	SR	21	3.8095	.50935	.11115	3.5777	4.0414	2.89	4.89
	DR	42	3.7500	.49800	.07684	3.5948	3.9052	2.44	4.61
	TD	32	3.6563	.50730	.08968	3.4733	3.8392	2.61	4.72
	KJ	31	3.6631	.49190	.08835	3.4827	3.8435	2.44	4.61
	BB	30	3.7722	.57815	.10556	3.5563	3.9881	2.44	4.61
	LB	31	3.8011	.51476	.09245	3.6123	3.9899	2.78	4.72
	TJ	29	4.0977	.48150	.08941	3.9145	4.2809	2.78	4.89
	Total	365	3.8044	.52706	.02759	3.7502	3.8587	2.33	5.00
Attitude towards Curriculum	PJ	30	3.6121	.37440	.06836	3.4723	3.7519	2.82	4.27
	AS	30	3.6576	.73804	.13475	3.3820	3.9332	1.36	4.64
	SP	28	3.9578	.36151	.06832	3.8176	4.0980	3.45	4.64
	KI	31	3.8182	.42120	.07565	3.6637	3.9727	3.00	4.64
	TK	30	3.7606	.52819	.09643	3.5634	3.9578	2.55	5.00
	SR	21	3.8182	.49710	.10848	3.5919	4.0445	2.73	4.64
	DR	42	3.6537	.37469	.05782	3.5369	3.7704	2.82	4.64
	TD	32	3.6051	.73370	.12970	3.3406	3.8696	1.00	4.64
	KJ	31	3.7713	.38057	.06835	3.6317	3.9109	3.00	4.64
	BB	30	3.6333	.44759	.08172	3.4662	3.8005	2.73	4.64
	LB	31	3.7243	.55916	.10043	3.5192	3.9294	2.09	4.64
	TJ	29	3.9154	.35537	.06599	3.7802	4.0505	3.27	4.64
	Total	365	3.7370	.50213	.02628	3.6853	3.7887	1.00	5.00
Attitude towards Teaching and Learning	PJ	30	3.5564	.40031	.07309	3.4069	3.7059	3.00	4.54
	AS	30	3.7949	.71488	.13052	3.5279	4.0618	1.62	5.00
	SP	28	3.9615	.43740	.08266	3.7919	4.1311	3.15	5.00
	KI	31	3.7122	.49771	.08939	3.5296	3.8947	2.77	4.69
	TK	30	3.6769	.59939	.10943	3.4531	3.9007	2.15	5.00
	SR	21	3.7949	.49335	.10766	3.5703	4.0194	2.85	4.69
	DR	42	3.7509	.47474	.07325	3.6030	3.8989	2.62	5.00
	TD	32	3.7933	.72066	.12740	3.5334	4.0531	1.69	4.92
	KJ	31	3.8710	.35551	.06385	3.7406	4.0014	3.23	5.00
	BB	30	3.6103	.49603	.09056	3.4250	3.7955	2.23	5.00
	LB	31	3.7171	.54912	.09862	3.5157	3.9185	2.54	4.92
	TJ	29	3.9098	.45881	.08520	3.7353	4.0843	3.00	4.92
	Total	365	3.7600	.53216	.02785	3.7052	3.8147	1.62	5.00
Technology Needs	PJ	30	3.8600	.50760	.09267	3.6705	4.0495	3.00	4.90
	AS	30	3.9500	.51378	.09380	3.7582	4.1418	3.00	5.00
	SP	28	3.9821	.60739	.11479	3.7466	4.2177	2.90	5.00
	KI	31	4.0258	.52850	.09492	3.8320	4.2197	3.00	5.00
	TK	30	3.8967	.59218	.10812	3.6755	4.1178	2.80	5.00
	SR	21	4.0810	.59634	.13013	3.8095	4.3524	3.00	5.00
	DR	42	3.9143	.47911	.07393	3.7650	4.0636	3.00	4.90
	TD	32	3.9125	.45561	.08054	3.7482	4.0768	3.20	4.90
	KJ	31	3.8065	.54095	.09716	3.6080	4.0049	3.00	4.90
	BB	30	3.9100	.64773	.11826	3.6681	4.1519	2.80	5.00
	LB	31	3.7645	.44087	.07918	3.6028	3.9262	3.10	4.50
	TJ	29	4.1069	.76435	.14194	3.8162	4.3976	1.00	5.00
	Total	365	3.9285	.55723	.02917	3.8711	3.9858	1.00	5.00

4- T-test to investigate the Differences between Genders toward the Attitudes of Islamic Education Teachers

Group Statistics

	a01 Gende	N	Mean	Std. Deviation	Std. Error Mean
C Attitude Toward Smart Schools	1.00 Male	30	3.8694	.46045	.08407
	2.00 Fema	71	3.6420	.44037	.05226
D Attitude Toward Computers	1.00 Male	30	4.0800	.46989	.08579
	2.00 Fema	71	3.7007	.41417	.04915
E Attitude Toward Curriculum	1.00 Male	30	4.3083	.81654	.14908
	2.00 Fema	71	4.3011	.47602	.05649
F Attitude Toward Teaching and Lear	1.00 Male	30	3.9974	.71292	.13016
	2.00 Fema	71	3.7454	.61725	.07325
G Technology Nee	1.00 Male	30	4.4485	.77468	.14144
	2.00 Fema	71	4.2164	.55434	.06579