ICT EDUCATION IN SRI LANKAN SCHOOLS: AN EXPLORATORY STUDY

Mrs. K.R.C. Koswatte[*]

Dr. Theekshana Suraweera[**]

Abstract

Information Technology (IT) has become an essential feature of the new millennium. The student perspective is examined as a key determinant in this study.

There are three specific objectives of this research

(a) Appropriateness of the resource distribution of the government and other parties for the ICT study in Sri Lankan schools
(b) Students readiness for ICT education in schools
(c) Sri Lankan background support for the ICT study of Sri Lankan Schools

Although Sri Lanka is providing ICT education in secondary schools it is not clear how far the desired objectives are met. The principle method of investigating in the research is case study approach. The study population is secondary school students who are studying ICT. Since the education facilities may vary between the urban or rural areas the research formation has been designed accordingly.

The findings of the research will be helpful to understand whether there is gap between the resource base provided by the government and the students ICT study in Sri Lankan schools. Specifically it was intended to find out how far the general objectives of introducing ICT education in Sri Lankan Schools have been achieved. Research findings show that everyone knows that IT is important in the future but most of them are not ready to get the maximum benefits that the government has been given. Computer literacy of a nation in future will be a benchmark to measure the level of education. So need to identify the existing problems in the ICT teaching and learning environment in schools.

Key words: ICT – Information communication Technology, IT- Information Technology, computer awareness, ICT infrastructure, Qualitative methods

[*] Center for Computer Studies, Sabaragamuwa University of Sri Lanka

[**] Department of Business and Information Management, Sri Lanka Institute of Information Technology Sri Lanka.

Introduction

Necessity to introduce new technology to younger people in Sri Lanka was identified in 1982. Reasons for this is wide spread use of programmable devices in society, computerized offices, services. Introducing this new technology will require some modification for the system and training. National policies of the Computer education have been formulated. The advisory unit of the school Computer Education Project (CEP) established in 1982. The computer awareness and familiarity program was imitated in to 112 lager advanced level science schools with the provision of micro computer in 1983. Developing countries suffer from various problems, but Sri Lanka itself struggles to overcome these problems by keeping its high standard of its educational system.

Information and Communication Technology (ICT) has become the state of the art technology of the contemporary world. Every sector of the economy is forced to use this technology to make their work effective and thereby to maintain a competitive edge. This has changed the types of skills and knowledge needed in the world of work.

The Department of Census and Statistics recently released the report of the Household Survey on Computer Literacy conducted in 2006/2007 by the department. The main objective of this survey was to assess the computer literacy of household population in the age group of 5 to 69 years and e-readiness of households. It also examined the availability of ICT related infrastructure facilities and use of computers and email/ Internet etc at households. [21]. Figure 1.z1 shows Computer literate population (5.-69 years) by province.

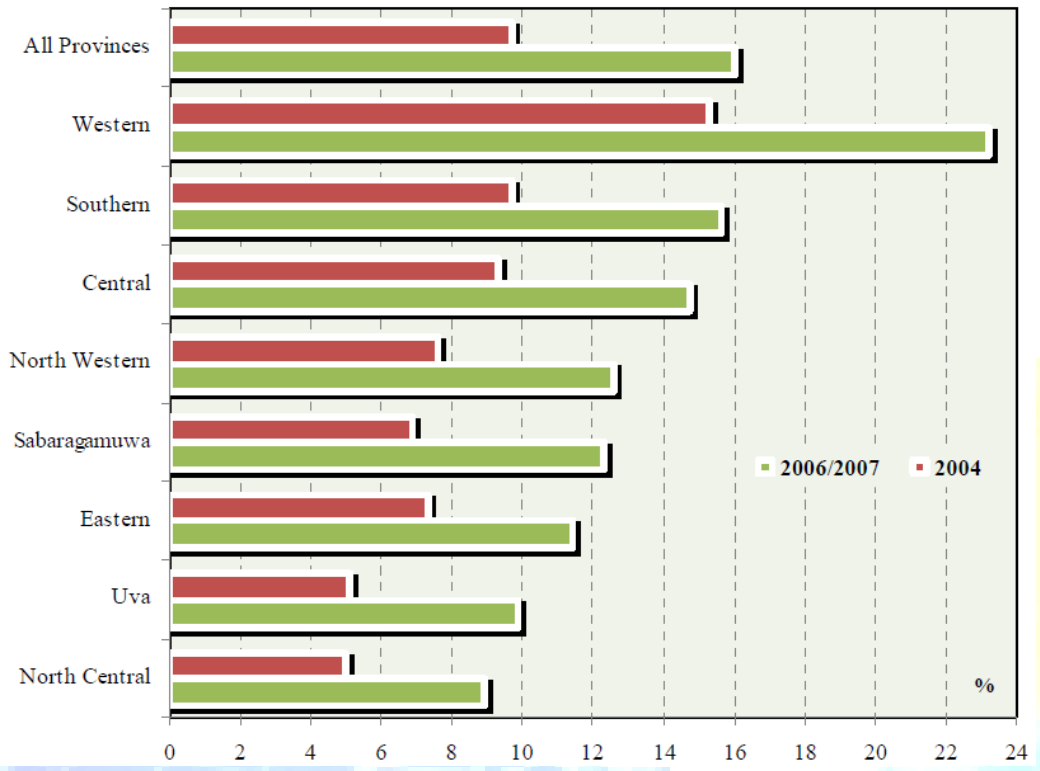

Figure 1.1 Computer literate population (5.-69 years) by province

Teachers are among the more educated population and more likely to have access to technology. On the average, about 28 percent of teachers in government schools are graduate teachers. The percentage of trained teachers is 68 percent. A statistical test carried out on the relationship between English language literacy, computer awareness and computer literacy shows that there is no significant relationship between English language literacy and computer awareness but there is a significant positive relationship between computer literacy and English language literacy. Also as expected, there is a strong relationship between computer awareness and computer literacy. Another statistical test carried out at district level revealed that, there is no statistically significant relationship between computer literacy of teachers and availability of computers in schools. This is a cause for concern. Having computers in schools alone do not improve the computer literacy of teachers [22]. Figure 1.2 shows self-reported computer awareness, literacy and English language and English language literacy of government school teachers.

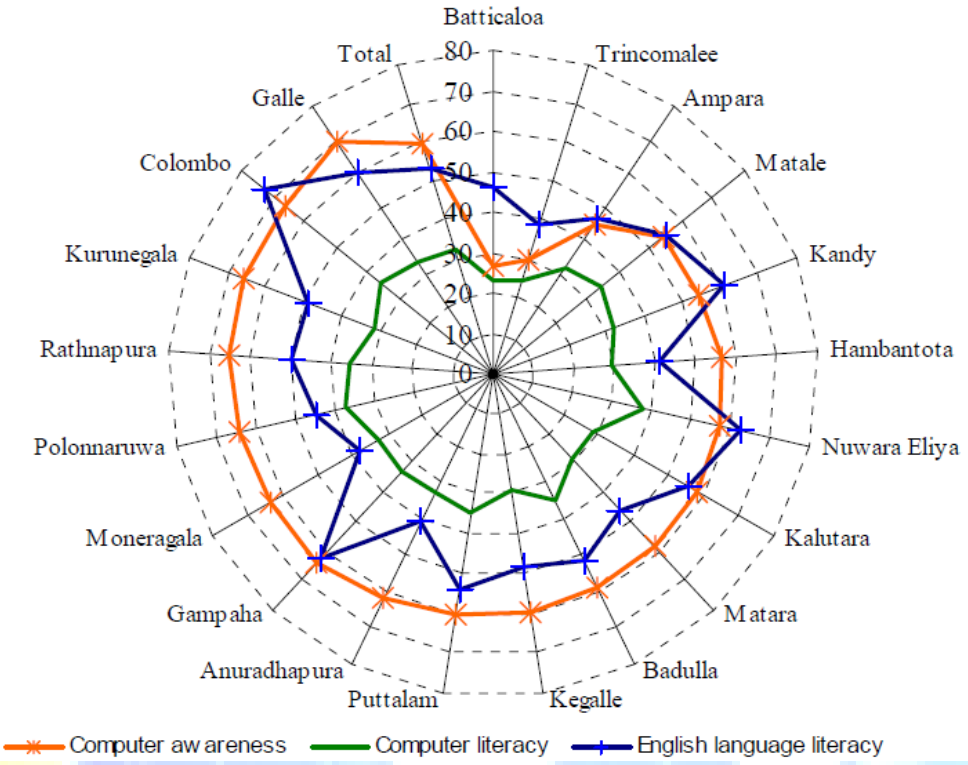

Figure 1.2 Self-reported computer awareness, literacy and English language and English language literacy of government school teachers (percentage)

Aim and Objectives

The Research problem is focused "To identify the relationship between the ICT resource base given by the government for the ICT study in Schools and students ICT learning environment in schools".

ICT has become the state of the contemporary world; Sri Lanka is in the early stages of introducing ICT. ICT was introduced to the Sri Lankan schools system in 1994. Since then the Ministry of Education is in the process of implementing ICT in the education system, with a view to enhancing the quality of education. To be successful in this effort government has identified the utilities such as computers and other electronic equipments that should be supplied to schools. This carrier was done by the government and various projects. When considering the human resources development teachers were trained for the ICT education in schools.

Considering the students perspective, new subject was added to the school curriculum and a new syllabus was in performed.

Government is arranging many ways of supplying the ICT resource base for the ICT study. Studies have been conducted in order to identify the impact of the skills gap in ICT industry, but many of these studies lack detailed investigation of what actually takes place in the ICT learning environment. Though the some studies have been conducted in other countries, cannot apply for the Sri Lanka because of the culture difference. Because according to the UNESCO [9] things point out need to learn ICT are will be quite less numbers for Sri Lanka. Therefore, this research study in ICT has shift the attention towards ICT learning environment, where students, teachers having the communication to learn ICT. The aim of the research is to identify whether there is a relationship between the resource base given for ICT study and the student's perspective in ICT study. Also going to recognize whether there are any other reasons causes for this connection in mounting or declining the ICT study in schools.

The broad objective of this research is to gain an in-depth understanding of ICT education in Sri Lankan Schools.

This objective is examined under three sub-objectives.

1. **Appropriateness of the resource distribution of the government and other parties for the ICT study in Sri Lankan schools**

- How far the ICT infrastructure currently available in schools support the ICT study?
- How far Human Resources Development supports ICT study?
- How far the other utilities such as electricity supported for the ICT study in schools?
- How far the curriculum has been developed to introduce sustain and enhance IT involvement into general education in schools and create opportunities for IT based learning?
- How far the support initiatives development ensures the sustenance of IT education in the schools system?

2) **Students readiness for ICT education**

- What is the effect from the language to the ICT education?
- How far the parents are involved for ICT education?
- How far the students productively utilize ICT resources?

- What is their attitude towards ICT and how far the attitude effect on studies?

3) **Country social, culture and environment supports for the ICT study of Sri Lankan Schools**

- What are the perceived values of ICT study?
- How the Sri Lankan culture supports for the ICT education?
- What are the achievements of ICT education?
- How the Sri Lankan education structure supports the ICT study?

Data and Methods

3.1: Introduction

This research can be considered as basic research whereas the latter is primarily restored to because of the important of the subject to the researcher. This study can be identified as an exploratory study when some facts are known, but more information is needed for developing a viable theoretical framework. Research will be included case studies and a survey. The methods associated with the three components will vary, influenced by the nature of the outcomes. Research will be based on qualitative and quantitative data.

Qualitative methods will be used for the better understand of the phenomenon about where little is yet known. At the same time to gain new perspectives on things about which much is already known, or to gain more in-depth information that may be difficult to convey quantitatively. Qualitative methods appropriate for this research, to first identify the variables that might later be tested quantitatively and where the quantitative measures cannot adequately describe or interpret a situation. Research problems will be framed as open-ended questions that will support discovery of new information.

The ability of qualitative data to more fully describe a phenomenon is an important consideration not only from the researcher's perspective, but from the reader's perspective as well. "If you want people to understand better than they otherwise might, provide them information in the form in which they usually experience it". [19] The proposed approach to handling each component is discussed below in separate sections.

Qualitative research and qualitative data gathering has been selected for the research because,

- Qualitative research uses the natural setting as the source of data.
- The researcher acts as the "human instrument" of data collection.
- Qualitative researchers mainly use inductive data analysis.
- Qualitative research data are descriptive
- Qualitative research has an interpretive character, aimed at discovering the meaning events have for the individuals who experience them and the interpretations of those meanings by the researcher.
- Qualitative research is judged using special criteria for reliability

3.2: Data Used

Primary data

- Data was collected from government sector, students, parents, and teachers by the researcher.
- Data collection was done through beneath ways.

Talking with people is a good way to get information during the initial stages of a research project. It can be used to gather information that is not publicly available, or that is too new to be found in the literature. But the information will be highly subjective and might not be representative of the population.

A *focus group* is used as a preliminary research technique to explore people's ideas and attitudes. Collection of data from the experts of the ICT education will be done in this manner. Their disadvantage is that the sample is small and may not be representative of the population in general.

Personal interviews are a way to get in-depth and comprehensive information. They involve one person interviewing another person for personal or detailed information. Personal interviews are generally used only when subjects are not likely to respond to other survey methods.

Secondary data

A *literature search* involves reviewing all readily available materials. These materials can include government ICT information, relevant publications, journal papers, annual reports, on-

line data bases, and any other published materials. It is a very inexpensive method of gathering information, although it generally does not yield timely information.

During the primary data collection the danger of non wiliness to divulge sensitive school information about ICT resources, during interviews also pose as a threat for this study because it is mainly handling with humans. Also it is not possible to obtain full country view due to practical situations and due to the time considerations. It is not possible to collect historical data from some of the past research carried out on this topic because most of the published researches were done in other countries. Those data were not matching for the Sri Lankan culture. One such information would be the attitude of the students towards ICT study in a more technological country would be quiet different from the Sri Lankan students attitude.

The research topic has a connection with the culture of the country, so need to find most of the data needed for the research as primary data. ICT sector is not much in the research studies of Sri Lanka. Difficulty of finding the researches done in Sri Lankan ICT sector because resent researches were not published anywhere.

3.3: Methods and techniques

Qualitative method is using in this research which is used to gain insight into people's attitudes, behaviors, value systems, concerns, motivations, aspirations, culture or lifestyles. One of the major reasons for doing qualitative research is to become more experienced with the phenomenon researcher interested in.

Research is basically in the view point of students. So in the first case researcher identified how students behave with the ICT study. Because it is hard to find researches conducted in this area related to Sri Lanka, case studies has to be done in order to identify the stuff that students need to study ICT in schools. A case study is an intensive study of a specific individual or specific context. There is no single way to conduct a case study, and a combination of methods such as unstructured interviewing, direct observation can be used.

The researcher was familiar with the specific techniques that are used in the current study, and supported by the literature that was reviewed in the previous articles. Case Study has four stages: [18]

- Design the case study,
- Conduct the case study,
- Analyze the case study evidence, and
- Develop the conclusions, recommendations and implications.

This study research suggestion is to conduct an in-depth study of the students, teachers and parents attitude towards the ICT study in schools using the case study. This study replicates and extends that study and thereby adds to the body of knowledge on the nature of information technology acquisition at schools. Case study is conducted in order to solve the problems that are not identified in the area of research. [28] This case study was designed as a multiple-case-study where independent innovations occur at different sites. [24] This each site is a subject of an individual case study and the study as a whole would have used a multiple case design. Several case studies were conducted in the below districts which was be selected with the practical situations but concerning the rural, urban and semi urban areas.

- Rathnapura district – Rathnapura town, Belihuloya town
- Kandy district – Kandy town
- Kegalle district – Kegalle town
- Colombo district

Case study generally answers one or more questions which begin with “how” or “why”. The face to face **interviews** will be limited to mainly above mentioned districts due obvious practical difficulties. Un-structured interviews will be used in order to minimize the obtrusiveness and influence on the students, parents and teachers. The main objective of these unstructured interviews is to bring some preliminary issues to the surface so that, determination of variables need further in-depth investigation can be prepared. First, although the researcher may have some initial guiding questions or core concepts to ask about, there is no formal structured instrument or protocol. Second, the interviewer is free to move the conversation in any direction of interest that may come up. Consequently, unstructured interviewing is particularly useful for exploring a topic broadly. However, there is a price for this lack of structure. Because each interview tends to be unique with no predetermined set of questions asked of all respondents, it is

usually more difficult to analyze unstructured interview data, especially when creating across respondents. Qualitative interviewing utilizes open-ended questions that allow for individual variations. **Recordings** have the advantage of capturing data more faithfully than hurriedly written notes might, and can make it easier for the focus on the interview. . One of the most common methods for qualitative data collection, **participant observation** is also one of the most demanding. Observational data are used for the purpose of description—of settings, activities, people, and the meanings of what is observed from the perspective of the participants. Observation can lead to deeper understandings than interviews alone, because it provides knowledge of the context in which events occur, and may enable to see things that participants themselves are not aware of, or that they are unwilling to discuss. It requires that the researcher become a participant in the culture or context being observed. The literature on participant observation discusses how to enter the context, the role of the researcher as a participant, the collection and storage of field notes, and the analysis of field data. Participant observation often requires months or years of intensive work because the researcher needs to become accepted as a natural part of the culture in order to assure that the observations are of the natural phenomenon.

The evidence from multiple cases is often considered more compelling and the overall study is therefore regarded as being more robust. Case studies were constructed mainly to be face to face interviews where un-structured interviews were taken into account mainly. Students were asked to reflect on recent experiences of using ICT in class and to answer questions about their experience. These answers provided scales of measures and that can be later used for quantitative analysis.

When selecting the case studies below points will be taken into consideration while case includes teachers and parents of the students.

- Geographical regions
- Different locations (urban suburbs, urban, and rural locations)
- Different types of schools status (1AB, 1C, Status 2)
- Different proportions of pupils from ethnic minority backgrounds (multi ethnic pupil populations)
- Different phases (the primary phase, the secondary phase, and mixed phases).

Both structures and unstructured Interviews should be done with some experts in IT sector, principles, IT graduates, non-IT graduates to gain some knowledge to see how the background supports this ICT study in schools. These interviews will be both structured and un-structured.

3.3.1: A specific method

Grounded Theory is most accurately described as a research method in which the theory is developed from the data, rather than the other way around. Grounded theory's data sources include all resources that yield information regarding social interaction. Data may be collected by observing and recording interactions, examining written documentation and literature, or obtaining perspectives from various people involved in the social interaction. The method used to reach a grounded theory is termed the constant comparative method. During data collection, data usually are analyzed concurrently. As the data are analyzed, the researcher searches for a core variable, which will serve as the foundation for theory generation. Data typically are coded at three levels. At the first level, the researcher examines data line by line, and at the second level, he or she compares and contrasts the data to create categories or clusters. At the third or final level, the researcher moves from data analysis to concept and theory development. Theory emerges with data reduction (e.g. filtering information relevant to the topic and discarding extraneous information) and selective sampling. Data usually are collected until no further new information is found. This process is termed saturation and signals the end of data collection. [29]

This qualitative research is basically in order to identify the appropriateness of the ICT learning environment in schools. So at the initial stage researcher have no idea about the questions that need to ask from the students, teachers. Basically students are more targeted in this research. It is not easy to identify what are real problems that students are facing in learning ICT in schools. This is the point where the Grounded Theory comes into the research. In first case researcher had a discussion with some students in an informal way. After gathering the data analysis is carried out for the collected data. Then researcher was able to identify some of the basic questions that need to be asking in the unstructured interviews. Then going to the second case with some basic idea, but still not clear. In this one try to clear up the things by going into deep, using the questions identified in the previous case. So this was continued until that the researcher

identified there is no new information to find out. At the end of the cases researcher has been identified the basic questions need to be ask from students, teachers and other related people in order to identify the what is really happening in the ICT environment and what are the new actions to be taken to improve the ICT learning environment in schools. So theory is developed by the analyzed data.

Results

4.1: Introduction

The analysis of the results was based on the findings from the answers to the observations, face to face unstructured interviews from teachers and students.

4.2: Results Cases

Case 01

Date: 2009/03/11

Age: A/L student

Location: Colombo School –Urban area

As she explained computer subject is not good for A/L syllabus but for O/L syllabus. Computer can learn at any time after the A/L exam. As A/L students we need more time to our major subjects because our target is not to learn computer but to enter the university. After that we can learn computer as our wish. "But actually we not manage time in such a valuable way. Mind is not ready for something that is away from out target is the main reason behind not interesting in learning computer in A/L classes. As students we are interested to be in a good position in class exams. So, if computer marks are adding for the exam sometimes this problem will count down.

Questions that can be identified by the Case 01

01) What is Students thinking manner for learning the computer subject?
02) What are the new changes that can be done to the computer subject?

Case 02

Date: 2009/03/11

Age: 45 years

Location: NIE (National Institute in Education)

"Students interest is never harmed from the number of resources that a school is having. If the teacher and students have necessitated teaching and learning the subject they are doing it very well with the help of the existing resources. Teacher should have a willing to provide time for students to do new things. Most schools are not trying to attend for the exhibitions to do innovative effects. Especially the Colombo urban area schools are less attending while far away rural area schools always trying to do something new. So in this situation I can say that resource distribution variation is not always a problem in learning computer." According to his explanation English is not a problem as students and teachers view out. Because in some cases English is essential but it is not a thing to be away from computers. But the other resources such as electricity are essential when working with computers.

Questions that can be identified by the Case 02

01) Is resource distribution always a problem in learning computer?
02) Teacher and student relationship?

Case 03

Date: 2009/05/22

Age: Two A/L Students

Location: Kegalle Village School – Rural – Mix school

Students like to learn computing because it is new thing for them. Students are very interesting with the new things that anyone can do with the computer. For an example one girl said "I like to make my own birthday cards using the paint program in computer without buying cards from a shop. By doing this I am getting a new experience in life and the person who is getting the card is asking me how you have done this which leads to self-satisfaction." They do not think that it is a problem for their learning processes in other subjects in the school curriculum. But, they are somewhat away from the town and due to that they are facing for English language problem when working with computers. For the day-to-day activities these students use the knowledge they are getting from the lessons in the school GIT and ICT programs. Most of these students have seen and touched a computer because of the school. At the mean time they like to work

with computers and they are very thankful for their school for giving such an opportunity for them. "The time for the computer subject is not enough because it is not like the other subjects, and we need more practical time for the computer subject. We feel that knowing computers is not only having the knowledge of theory but the practical knowledge to do things from the computer. I did art subject the in the O/L classes, so because of this it is not easy to handle the GIT subject. Teacher is also doing the GIT subject by thinking that students know about the computer subject." As village students they always see the difference between town and the village. Students who are in the town go for extra computer classes because they think that they need extra knowledge in the subject. Village students never have an idea about going for extra classes due to their financial problems. But they always compare it with the town students. They think that their friends in town and who are going for town schools having more opportunities than them and because of this they are in front which leads less opportunities for village students.

Questions that can be identified by the Case 03

01) What are the new opportunities students can gain by learning the computer in school as a subject?
02) Is learning computer in school a barrier for other subjects?
03) Is that the knowledge gaining from the computer subject is helping day-today activities?
04) Does the computer subject have enough time allocation?
05) For the computer subject theory or practical are more valuable?
06) Can teacher understand the different student's levels before teaching the computer subject?
07) Is it a must for attending for extra computer classes?
08) Is there a difference in learning the computer subject in a rural school and in an urban school?
09) Is English language a problem in learning computer?

Case 04

Date: 2009/05/22

Age: Six O/L Students – Year 10 and 11

Location: Kegalle Village School – Rural – Mix School

Only set of students in year 10 and 11 doing the ICT subject as a technical subject and number is less in selecting this subject. These six students said that their friends like to learn the ICT

subject, but not to pass the exam. "Our friends like to learn about computers but they are fearful to select the subject thinking that they would not be able to get a good pass for ICT because it is a new subject. And also we all are not good in English. So we always have questions whether we can grab the things correctly. We all need to pass the exam well, and because of this most of the students select the other technical subjects other than the ICT." Most of these students who selected this ICT subject are very interested in the subject and they are completely sure that they can get a good pass for the subject. "As my friends said we are always facing the language problem very critically when working with computers. We cannot understand the messages giving by the computer in some situations. When we consider about the school side, our teacher is teaching us very well and she is doing her best to give us as much as correct knowledge. But the numbers of working computers are not enough for our studies. Considering the numbers only 5 computers are working out of 20 computers. This will not be a critical problem if we have enough time remaining for the subject. When we take the other technical subjects they are much familiar with our day-to-day activities. So there is no need of putting much concentrate to learn it. But ICT subject is useless with out practical." These students totally agreed that they do not need private classes for the subject. One boy among the six students said something very significant. "I am very proud to say that I know computing. When someone asked that they have a problem in their computer I can check what is wrong and fix the problem. Also knowing computing is big advantage as I have experienced. But as we are in the village side we have no opportunity to show our talents to others."

Questions that can be identified by the Case 04

01) Why less number of students chooses the computer subject as a technical subject?
02) Students are learning the computer subject with having an interest in learning?
03) Teacher dedication in teaching the subject?
04) Resources having for a school in learning the subject?
05) What is the difference in computer subject when comparing it with other subjects?
06) Schools are having enough resources or not?
07) Will computer learning improve student knowledge?

Case 08

Date: 2009/06/05

Age: Lady Teacher – 45 years

Location: Kegalle Village School – Rural – Mix School

She is the English teacher in her school but later ICT and GIT subjects were also given to her. She has been attended to the training programs conducted by the NIE for computing. She is very interested in teaching the subject. As she explains in O/L classes less number of students doing the ICT subject because students need of getting good passes for the subject rather than learning computer. That is the reason students move for other technical subjects. "Learning computing is not just theory, students need to be practical. It is not easy to expect such a thing from students because they are in the path of getting good results." A/L students' presence is very poor. Only students who are interested in learning the subject are attending for the classes. Another reason is students who have done the ICT subject knows that they know computing and not interesting in coming for classes. "We have only 2 hours (3 periods) for the subject. This is not enough because this is purely new subject for most of the students. Subject like home science are attached with students life. So need more concentration for this computing subject. Using the library is very important and I am happy to say that our students are using the library. Our library contains few books that are more important in basic learning in computing." According to her explanation only 5 computers are working out of 15. But it has been 6 years passed for these computers. Maintaining is done by the company only up-to 2 years of time period. According to government procedures after that maintenance should be done by the Computer center itself. But these teachers have not been given a good training in hardware to do such a responsible job. "There is a way of getting money for the center. As teachers we have to conduct classes after school for students and collect money for any other necessitate of the lab. This is not possible for all the teachers. By the time allocating another teacher for this teaching I not possible because 30% will be given to the teacher while 70% will be gone for the center. There is no proper time for the GIT exam in A/L exam. Also results were not released properly. So by all these effects teacher as well as the students' interest for the subject has reduced comparing with begin.

Comparing the GIT students performance Science students are well performing in the subject. Analytical skills of students are very important in learning the computing.

Questions that can be identified by the Case 08

01) Is teacher having a good training for the subject?

02) Why students are having less attending for the computer subjects in A/L classes?
03) Resources using of students?
04) How the maintenance of the computer resources are being done?
05) A/L exam paper preparation of the GIT subject?
06) Are students need special skills in learning the subject?

Case 10

Date: 2009/06/20

Age: University Lecturer – 29 years

Location: Sabaragamuwa University

According to her explanation she is telling that by the ICT knowledge gaining from the schools are not worthy for students for career life. As Sri Lankan we believe that Doctor or Engineer are the best jobs in Sri Lanka and students are more concerning about other subjects more than computer. If Sri Lanka has a carrier path in computer side students who are interested in computer can do their studies in that path. For this need of adding the computer subject from year 6 and there should be a particular subject stream in A/L to continue with that. "But then the government is facing a problem with human resources facility to schools. To teach A/L classes teacher should be a graduate but those who have gain a computer degree are not interesting to join for schools by considering the salary scale. So this is more complicated question than seen from the surface."

Questions that can be identified by the Case 10

01) Sri Lankan culture affection for learning computer in schools?
02) Adding a new stream from computer side for A/L curriculum?

Case 11

Date: 2009/07/31

Age: Male teacher -55 years

Location: Sabaragamuwa – Urban area

According his explanation introduction of computer subjects for A/L and O/L is very essential and it is better for all students to learn it. But it is not success due to some weak points of the government, teachers and students. "Students have no necessitated for learning computer because of other major subjects and their university target. Those who have no computer knowledge do not need of grabbing the new knowledge. So they are rejecting to come for the class in A/L classes. Those who have computer knowledge like to take that time for their leisure time such as playing a game." In A/L classes this computer subject is not east to handle by art and commerce students which reduces their attention for the subject than the science students. There is no proper time for the GIT exam which is a poor plan in government side. In one year it is after the grade five examinations and for this year still it has not been held. Students have finished their all exams but not this exam. So when the time comes to face for the exam they have forgotten what they have learned during the past years. But some students are going for classes during these months and facing for the exam which all students cannot done. So there is no solution for this from school side because new classes are coming from the august and teacher is not having time for these students. Major curiosity for a subject is the results of that subject. For this subject in earlier stages results were not given but form the reason years results are coming but not in the targeted time. "Actually syllabus is very good in both O/L and A/L computer subjects but the time allocation is not enough. Some teachers are not concerning about the time for the GIT subject and continue with their own subject. Also in schools all the extra activities were done in this period. Students need time to come for the lab and also they have to be prepared in the lab for the practical. So in this case time is a very critical factor for this subject. Resources are not enough because in A/L classes they are about 45 students and only 20 computers are remaining. When considering about the maintenance it is not easy for some schools. After 5 years maintenance has to be done by the schools which need some money. To accomplish money have to undergo the given procedures which is actually very significant. So in the begin government have decided to give the hardware knowledge for the teachers as well as students. But it is not successful and in boys schools maintaining is going but not in girls schools. Also network knowledge is very much poor." As he explained knowing computer is not only theory but have to be practical. When considering about the current bill in schools all the bill except the computer lab current bill is handling by the government. So the center teacher is always trying to minimize the current bill by not using the lab as much as possible. Also air

condition is not using which leads computer condition down. "Also need to speak about the responsibilities of the computer teachers. Maintaining the lab and to fill number of forms given by the government. Normally teachers are not filling these forms but those who are doing this not giving the correct information. So sometimes if government is doing some analysis with the help of these data it is completely wrong. And the way that government is trying to improve the computer literacy of teachers is not acceptable which leads to dissatisfaction of the teachers. When selecting the computer teacher it is better not to give those teachers any other extra subjects in school."

Questions that can be identified by the Case 11

01) Government dedication for the ICT and GIT subject enhancement?
02) What are the teacher responsibilities in teaching the subject?
03) Are teachers well experienced in the subject area?
04) About the ICT and GIT syllabuses?

Discussion

5.1: Introduction

Research original study aim was discussed with the results taken from the data analysis.

5.2: Discussion

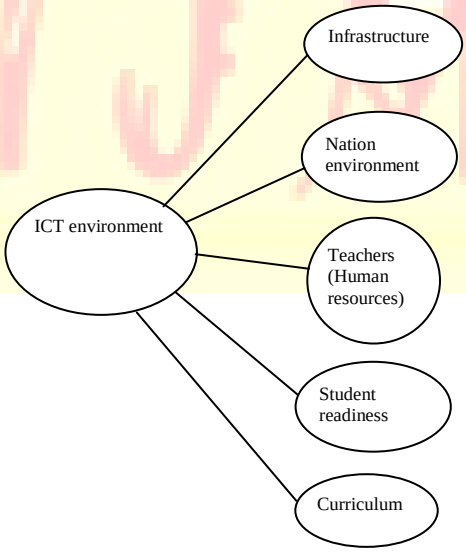

Figure 5.1: ICT environment

5.2.1: Infrastructure Facilities

Among the case studies except one, all schools had a separate room for the computer lab with Local Area Network (LANs) and also with the internet facility. To be considered as a computer lab there are several criteria to be completed. According to the ICTE (International Conference on Technology and Education) unit of the Ministry of Education there should be a separate room with more than 10 working computers and a LAN. Most of the case studies conducted can be considered as school with a computer lab.

As IT is introduced as a subject to schools in recent, these results show that infrastructure facilities are in a good standard. Students have considered Computer lab, Computers, Air condition, Network (internet) and projector as the minimum infrastructure necessary to learn computer. But some facilities were not used to get maximum benefit due to several identified problems.

- Not much enough time for the subject
- Most of the computers are not working
- Teachers do not have enough time to pay more attention for the subject and to do more practical sessions
- In some of the schools center managers were also not released from other subjects. As a result of this some centers were not opened during the school time.
- Some schools tried to protect the computer labs minimizing the practical time
- Because of the current bill some are not opened

According to the cases of students and teachers they have enough infrastructure facilities in the schools for the teaching and learning process of computer. But the maintaining is not at a satisfactory level. Learning computer is not only theory so with out the infrastructure it is difficult to learn the ICT. So there should be a proper way to conduct the maintenance of infrastructure in a school.

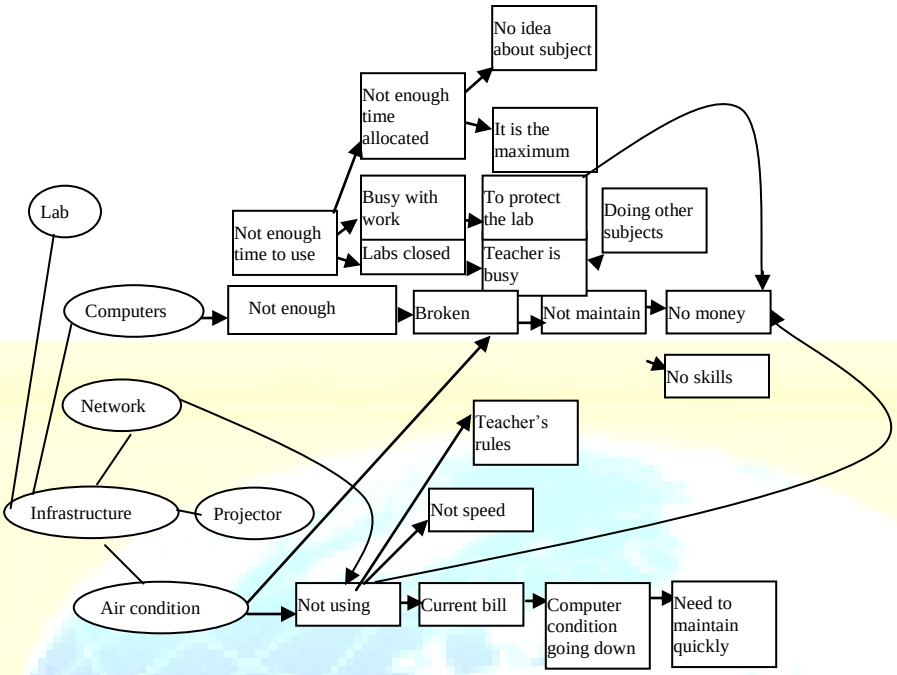

Figure 5.2: Infrastructure facility

5.2.2: Teachers

Conducted case studies are proving that teachers who are teaching computing are well educated and having a good training for IT teaching. But the problem arises when those teachers are assigned to other main subjects in school. Then their attention is focused mainly on to the main subject. Also because of this they haven't enough time to update their knowledge. Therefore they show less interest in this subject. For the successive implementation of a subject the students as well as the teachers should accept it. Some teachers were not agreed for introducing the GIT subject for the A/L classes because it is a useless thing. This is because there is a big competition among A/L students for university entrance. A/L teachers are also paying more attention to the main subjects. Teachers are having a clear understand about the syllabus and having sufficient knowledge to teach the subject. Teachers need a updating in the subject by trainings. Also need to appoint computer teacher only for that subject. Student attendance is poor in A/L classes for the computer subject and also the no interest in learning the subject. Because of this cannot complete the syllabus. Infrastructure facilities are limitation in some situations. Insufficient English knowledge is also a barrier in the learning and teaching process.

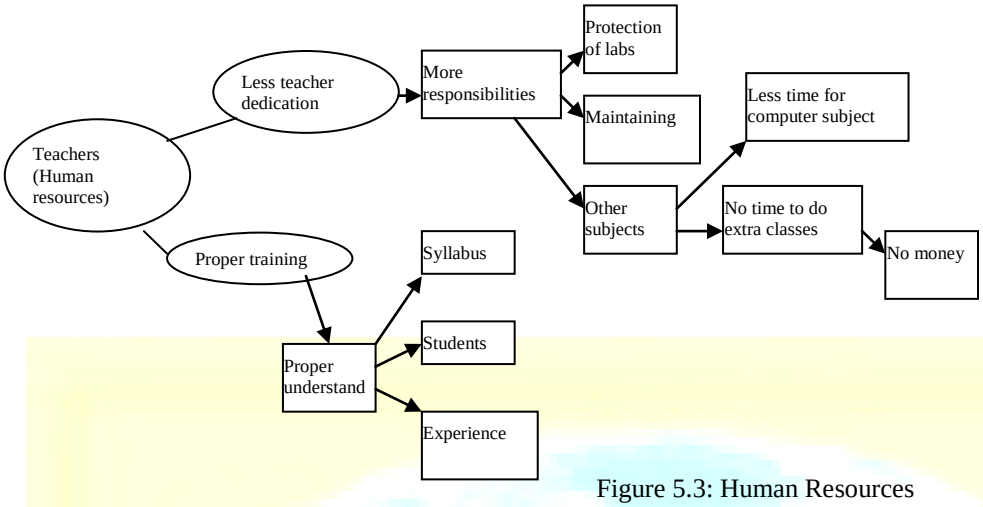

Figure 5.3: Human Resources

5.2.3: Teachers and Students view

Many students are interested in learning the ICT subject but not the GIT subject. According to the teacher explanation it is same. Majority of the students reject that it is not appropriate to introduce GIT for A/L because in their main target is to enter university. But ICT subject is fully accepted from students but still there fewer selections of the subject because it is new to students and they are afraid of that.

Teaching learning process was mainly conducted in the English medium. During the initial step of this research researcher was understood that the medium of this subject has become a major problem in some situations. Because of that several interviews were carried in Sinhala language. Teachers as well as students in the village schools highlighted that insufficient English knowledge of students is a barrier for the teaching and learning process of ICT. GIT was first IT subject that was introduced to government schools. Later ICT subject was introduced. Majority of the students were not getting the basic knowledge on IT in O/L classes. So when it comes for the A/L classes less number of students are interested in learning the subject because of this knowledge gap.

From the computer subjects' knowledge has been improved but as teachers explained it is not up to the standard that the government expected. But students appreciate importance of the IT in

national development. If government can introduce IT as an optional subject for A/L classes that will help to obtain the objectives as expected.

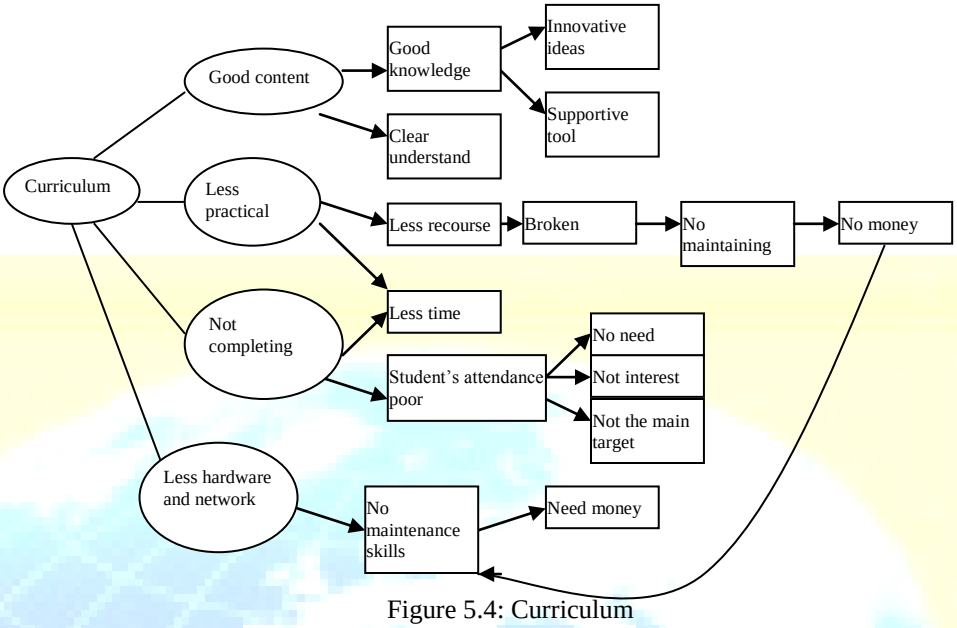

Figure 5.4: Curriculum

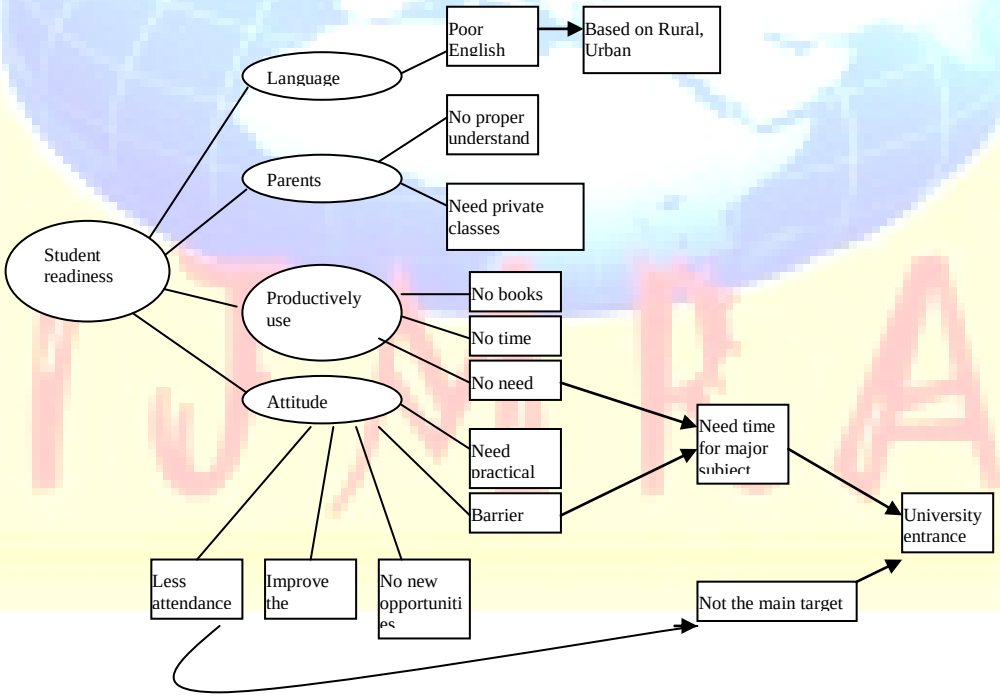

Figure 5.5: Student Readiness

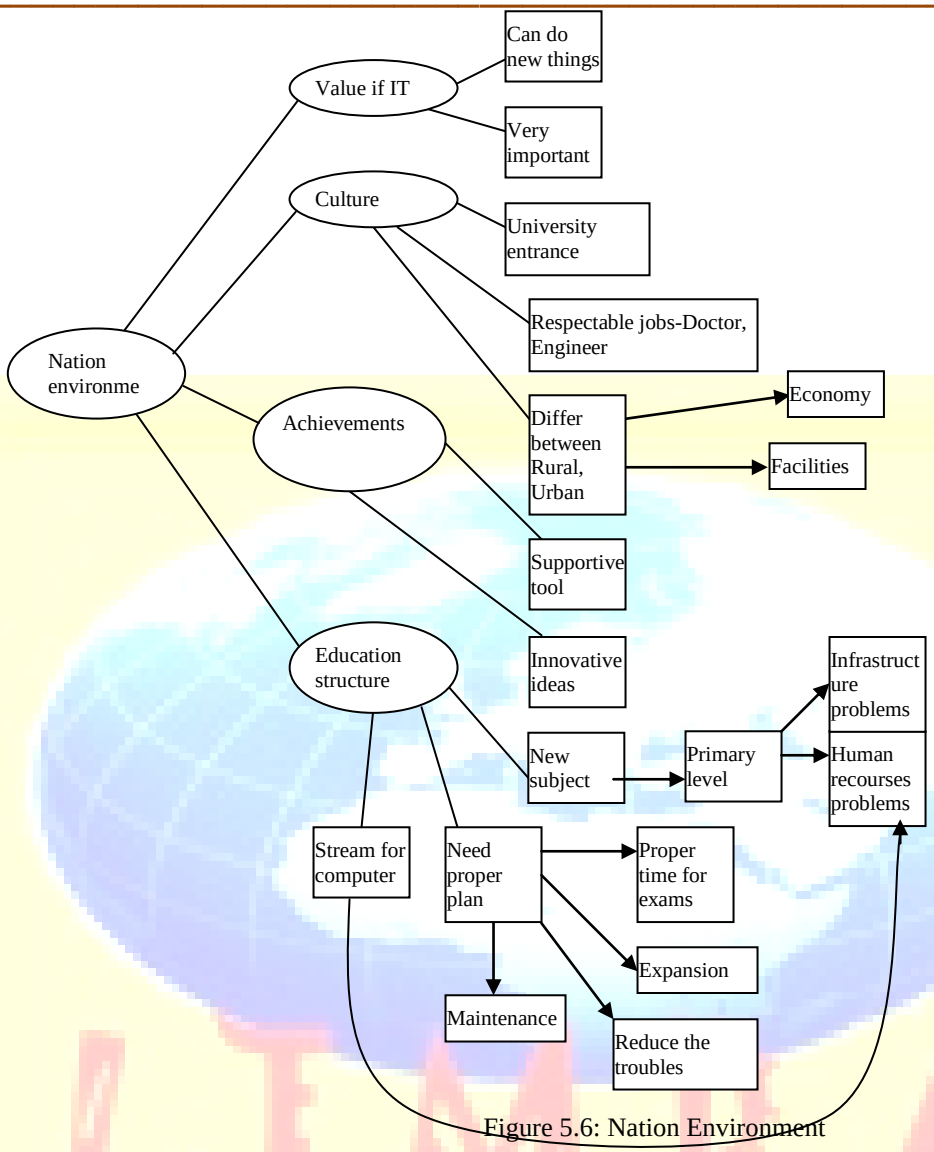

Figure 5.6: Nation Environment

Conclusions

6.1: Conclusions

In this research, an attempt has been made to answer the questions of Appropriateness of the resource distribution by the government and other parties for the ICT study in Sri Lankan schools, Students readiness for ICT education and Country social, culture and environment supports for the ICT study of Sri Lankan Schools. The research results show that there is several factors effect for ICT learning environment of students.

There are several projects conducted by the government and the other parties for the ICT. So research results shows that recourse distribution is not the main problem in the ICT learning and teaching process in schools. Maintenance of the resources is the critical problem schools are facing according to the research findings. Human recourse is not a limitation for the process but the effectiveness of the process has been gone down due to the work load of the teacher. Computer teacher should be only for the computer subject. Subject curriculums are giving excellent knowledge for students but hardware and network awareness is less.

Most of the students are not ready to learn computer in A/L classes because their main target is to attend the university. Rural area students are having the English language problem which leads hard for them to learn the subject. In addition students do not have enough time for the subject as well as less practical. Student's knowledge is not enough to grab the subject because sometimes it needs analytical skills for the subject.

Research findings show that everyone knows that IT is important in the future but most of them are not ready to get the maximum benefits that the government has been given. This is because as Sri Lankan we believe that every student needs to be a doctor or an engineer. So until entering to the university main target is giving maximum time for the main subjects. So, sometime recourses given for students are useless.

These problems can be minimized by introducing new stream for computer also in the A/L curriculum or to include it as a part of the other subject. If the teacher can conduct the teaching process with both English and mother tongue is also vital. If government can provide the basic IT knowledge to students from the primary level it is very easy for the teaching and learning process. There should be a proper way of maintaining the infrastructure of the schools.

The well being of their citizens has become the main criteria in the new millennium when judging a nation. Education holds supreme and is one of the main determinants in this. Computer literacy of a nation in future will be a benchmark to measure the level of education. Sri Lanka's success in achieving high levels of basic literacy can be capitalized on by pursuing a well

thought out strategy on achieving high quality IT education in the school system. Need to identify the existing problems in the ICT teaching learning environment in schools.

6.2: Recommendations

In this study researcher has only identified the factors that cause the ICT education in Sri Lankan Schools. But it is more effective to identify how these factors may be at variance between the areas. Also computer literacy of students as well as teachers can be identified as a further study. Need to analyze the student's utilization of ICT knowledge as a supportive tool for the other subjects. Teacher training programs are being conducted by the government and the other parties but need to identify the problems and need to program them effectively.

References

[1] Internet:http://www.education.gov.lk/home.php, [Mar. 18 2009]

[2] Sri Lanka: The Training of Teachers in Information Technology Internet:http://www2.unescobkk.org/education/ict/v2_2/info.asp?id=10963, [Apr. 9 2009]

[3] ICT Branch Establishes Hardware and Network solution Pool Internet: http://www.moe.gov.lk/view_news.php?ID=14,[May. 20 2009]

[4] Secondary Education Modernization Project I Loan 1756 SRI (SF) Internet:http://www.moe.gov.lk/semp/htmldocs/about_semp1.html,[May. 20 2009]

[5] Secondary Education Modernization Project II Loan 2096 SRI (SF) Internet:http://www.moe.gov.lk/semp/htmldocs/about_semp2.html,[May. 20 2009]

[6] C. Ping Lim, A theoretical framework for the study of ICT in schools. British Journal of Educational Technology, 2002, 33(4), 411-421.

[7] C.A. Granger, M.L. Morbey, H. Lotherington, R.D. Owston & H.H. Wideman, Factors contributing to teachers' successful implementation of IT, Journal of Computer Assisted Learning, 2002,18, 480-488.

[8] M. Woolley, ICT and Systems of Education: Formal, Non-formal, and Lifelong, International Conference on Education Bangkok, Thailand, 11-l 4 December 2001

[9] P. Smith, P. Rudd and M. Coghlan National Foundation for Educational Research, Schools Survey, September 2008

[10] G.M.Niel Gunadasa, ICT in Education Policies in Sri Lanka: Challenges and Opportunities, e-Global Leaders Conference, Seoul, Korea, Sept.19 & 20, 2007

[9] A. Semenov, Information and Communication Technologies in Schools. Moscow Institute of Open Education, Russian Federation, UNESCO 2005

[11] G. M Eadie, S.l Marsden, The Impact of ICT on Schools: Classroom Design and Curriculum Delivery, February 2001

[12] A. Balanskat, R. Blamire, ICT in Schools: Trends, innovations and issues in 2006-2007,June 2007.

[13] D. Passey and C. Rogers, with J. Machell and G. McHugh, The Motivational Effect of ICT on Pupils , 2004.

[14] L. Smith, C.G. Rogers, and P. Tomlinson, (eds.) Development and Motivation: Joint Perspectives (Vol. 2). Leicester: The British Psychological Society, 2003.

[15] C.S. Dweck, Self-theories: their role in motivation, personality, and development. Philadelphia, Penn.: Psychology Press, 1999

[16] J. Macbeath, and P. Mortimore, (eds.) (2001) Improving school effectiveness. Milton Keynes:Open University Press

[17] A. Datnow, and M. Castellano, (2000) Teachers' Responses to Success for All: How Beliefs,Experience, and Adaptation Shape Implementation. American Educational Research Journal, 37(3), 775

[18] R.Yin, *Case study research: Design and methods*, 2nd ed. Thousand Oaks, CA: Sage Publishing, 1994.

[19] Y. S. Lincoln, , & Guba, E. G., *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications, Inc, 1985.

[20] J. M. Lin (2008) .ICT education: To integrate or not to integrate. British Journal of Educational Technology. (Vol 39 No 6 2008 1121-1123)

[21] Computer Literacy of Sri Lanka, Department of Census and Statistics –Sri Lanka, 2004.

[22] Computer literacy of teachers, Department of Census and Statistics –Sri Lanka, 2006.

[23] Uma Sekaran, Research Methods for Business, A Skill building Approach, 4th Edition, 2006.

[24] Robert K. Yin, Case Study Research Design and Methods, 2nd Edition, 1994.

[25] Karunanayake, K.A.V., Computer Program Guidelines for Resource Centers in Schools, Maharagama, NIE Press, 1997.

[26] Maduwage, S.N., Information and communication technologies for professional development in Sri Lanka, Master of Science, University of Waikato, 1999.

[27]Internet: http://schoolnet.lk/index.php?lang=en&for=default&page_id=18,[Sep 15 2009]

[28] Internet: http://www.socialresearchmethods.net/kb/qual.php,[Sep 15 2009]

[29]Internet:http://findarticles.com/p/articles/mi_m0FSL/is_6_73/ai_75562157/,[Sep15 2009]