



CHALLENGES OF TEACHING INFORMATION AND COMMUNICATION TECHNOLOGY IN ESTATE SCHOOLS OF SRI LANKA

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Abstract

Information and Communication Technology (ICT) is the dominant factor almost in all institutes in the current Era. Sri Lanka's education system also included ICT as a subject in their school curriculum as a step by step process to offer the country most successful future citizens who will take part in the country's economy. While the use of ICT rapidly growing, this research is aimed to identify the challenges faced by teachers and students when teaching ICT in Estate schools. Qualitative and quantitative approaches were used for this study to identify the most important challenges in this field. Structured interviews and observation mechanisms were used for the primary data collection to identify the major challenges in this field. This study identified three major challenges, they are Language Barriers and lack of Knowledge in other key subjects such as English, mathematics etc..., the insufficient number of periods and poor technological background of the students, Technology Barriers and Fear of Administration. Also, this research is identified that the students' positive attitude to learning ICT.

Key Words: ICT Teaching, Estate Schools, Challenges of Teaching

1. Introduction

“Information and communications technology (ICT) refers to all the technology used to handle telecommunications, broadcast media, intelligent building management systems, audio-visual processing and transmission systems, and network-based control and monitoring functions” (information-and-communications-technology-ICT, 2019).in the past few years, ICT has change societies' way of communication and their lifestyle. The United Nation's Millennium Development Goals (MDGs) and national development plan of most countries are targeting for improving the education sector to achieve development of the people. To achieve the MDG Promoting ICT in education is important. According to that The United Nations' stainable Development Goal 9 “is investing in ICT access and quality education to promote lasting peace” (Sustainable Development Goal 9, 2017).

Hence, the importance of the ICT and the current world trends push all the sectors to use ICT in their day-to-day activities. According to this state since the mid-1990s, Sri Lanka's education system also introduce new policies, procedures and curriculums to improve the ICT knowledge and competency to use ICT among the school students. Because it's well recognised that education can aid the development of a country by creating a more productive workforce. In a school ICT can use I two ways: 1. Technological Education -Emphasis on studying the ICT itself, 2. Educational Technology – it's getting ICT Support for learning and teaching. This study is focused on those two ways and identifying the challenges which faced by teachers when using those two methods in an estate school environment.

According to the School Census report of the Ministry of Education, Sri Lanka (2017) the country today has a student population of **4,165,964** students at **10,194** schools (both government and private schools) with over **241,591** teachers within the country's education system. Though Sri Lankan government made several attempts in ICT education programmes, it has not been reached the expected results. Due to this, the Sri Lankan government has taken steps to integrate ICT education to school education curriculum since the year 2005. To that, the Ministry



has developed two approaches such as ICT as a subject and ICT as a tool in learning and information handling. One of the key achievements of this programme is the introduction of General Information Technology (GIT) as a common subject for Grade 12 students in the GCE Advanced Level. After that **ICT** was very first **introduced** in 2006 January as an optional **subject** for the **O/L** and the necessary planning has been completed to introduce ICT into Junior Secondary (Grades 6-9) and primary (Grade 1-5) levels. As a first step education ministry already published ICT books for grade 6-9 in 2018 and now most of the schools teach ICT for grade 6-9 students. These programmes follow the policy framework approved by the Government in 2001 and various programmes such as teacher training, electronic education content development, ICT students associations and various other initiatives are in action to support them. According to the Ministry of Education’s circular 2004/20, has identified 4 pre-requisites to Conduct teaching GIT in a particular school namely, 1. A minimum of 4 computers. 2. One teacher with sufficient subject knowledge and training on that field. 3. A secure room (lab) with electricity supply. 4. Sufficient furniture to conduct the teaching activities. Considering this requirement currently many schools provide ICT as a subject for the students (from grade 6 – 13), for grade 6-9 ICT subject in schools they allocate only 1 period per week. The following table provides the information regarding the syllabus content of ICT subject (Grade 6-9).

Table 1. **Content** of the ICT syllabus (Grade 6 -7)

Grade 6	Grade 7
1. Importance of the computers	1. Central Processing Unit
2. Let's use the Computer Laboratory Safely	2. Operating System
3. Operating System and File Management	3. Security of the Computer System
4. Using Mouse and Keyboard to use Application Software	4. Word processing
5. Algorithm and Flow Charts	5. Programme Development
6. Using the Internet for collecting Information and Communication	6. Presentation Software
	7. Using Internet for Information and Communication

Table 2. Content of the ICT syllabus (Grade 8 -9)

Grade 8	Grade 9
1. Number Systems	1. Preparation of Computer Specifications
2. Configuring and Formatting a Computer	2. Electronic Spreadsheets
3. Word Processing	3. Programming
4. Programming	4. Use of Microcontrollers
5. Physical Computing	5. Computer Networks
6. Internet	6. ICT and Society

Up to this point I have discussed about the importance of the ICT and its application in schools of Sri Lanka, now will firstly understand what is teaching and learning. The definition of Teaching shows that “Teaching is the process of attending to people’s needs, experiences and feelings, and intervening so that they learn particular things, and go beyond the given. Interventions commonly take the form of questioning, listening, giving information, explaining some phenomenon, demonstrating a skill or process, testing understanding and capacity, and facilitating learning activities (such as note-taking, discussion, assignment writing, simulations and practice)” (Smith, 2016, 2018). And the definition of Learning **says** that “Learning is the relatively permanent change in a person’s knowledge or behaviour due to experience”. This definition has 3 components: 1) The duration of the change is long- lasting rather than short-term; 2) the focus of the change is the content and structure of knowledge in memory or the behaviour of the learner; 3) the cause of the change is the learner’s experience in the environment rather than fatigue, motivation, physical condition or physiologic intervention.” –*From Learning in Encyclopaedia of Educational Research, Richard E. Mayer* (Malamed, 2016). If we closely look into these both definitions of teaching and learning we can clearly say that without efficient teaching and learning process we can’t gain the expected outcome from the educational process. Normally the Bloom’s taxonomy is (set of three hierarchical modules) used to classify educational learning objectives into level of complexity and specifications. Normally a teaching and learning process is aim to achieve these hierarchical modules at the end of their process. The following figure describe the Bloom’s taxonomy with its expected outcomes.



Bloom's Taxonomy

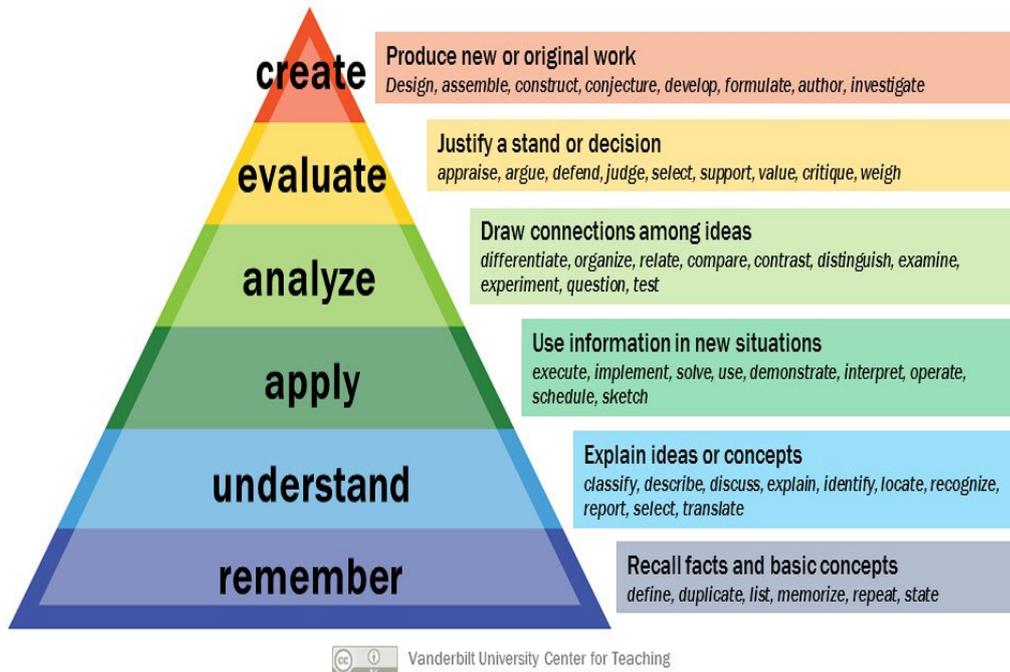


Figure 1. Bloom's Taxonomy (Patricia Armstrong, n.d.)

The increased use of ICT has greatly contributed in enhancing people's living standards and their way of communication as well. According to the Computer Literacy Statistics of Department of Census and Statistics in 2018(January - June), **Percentage of computer owned households by Sector and Province** as follows.

Table3, Percentage of computer owned households by Sector and Province - 2016 to 2018 (During 1st six months)

Sector/ Province	Desktop (%)			Desktop or Laptop (%)		
	2016	2017	2018	2016	2017	2018
Sri Lanka	13.1	12.5	10.5	22.5	23.5	22.9
Urban	19.6	19.9	15.5	35.3	39.9	39.5
Rural	12.2	11.5	9.9	20.7	21.0	20.3
Estate	5.0	3.5	2.2	6.4	5.1	4.9
Provinces						
Western	19.6	19.5	14.6	34.8	37.1	33.4
Central	13.9	11.6	11.8	22.4	23.3	22.5
Southern	11.9	10.0	9.5	19.6	19.0	20.8
Northern	6.9	5.9	7.9	15.5	18.6	21.2
Eastern	6.0	6.2	5.7	12.2	11.0	13.5
North – Western	10.1	11.5	9.5	20.4	21.1	20.8
North - Central	8.9	9.2	7.8	13.5	16.5	17.1
Uva	9.2	6.8	5.1	12.9	9.7	10.7
Sabaragamuwa	12.9	13.1	10.8	18.6	20.4	19.7

According to this statistics, we can observe that due to the government has introduced many ICT related development projects ICT Usage is increased in most of the provinces but still, it has some short emergences in estate sectors. Based on these. To implement this research study I had chosen Sri Kathiresan Tamil School which



is located in Deraniyagala (in Kagalle district). The student population, who attend this school were come from about 18 different Estates which is located around this school. Estate names were (Dabar, Dickland, Miyanawita Estate, Pambagama Estate Pahala, Yatipola, Bopekanda, Udapola Estate, Glentress, Illuktenne, Nahalma, Sapumalkande Estate, Anhettigama Estate, Walpola Estate, Lissanagama Estate, Kehelwala Estate, Maligatenna, Wellehinda Estate, and Udahenkanda Estate). According to above-mentioned details, it shows that there is more probability to exist challenges in teaching ICT at estate schools. Studying these it can identify that the environment of the student impact on the students learning process and teachers teaching activities as well, likewise the barriers which may exist in environment will also impact on the outcomes of the education system.

Objective of the study is to explore challenges of teaching ICT in Estate Schools.

2. Literature Review

In the globalized world, most of the developed countries are increasingly ICT dominant and therefore investing in ICT the 21st century has become a compulsory requirement for a country to survive. Due to this importance of the ICT, many researchers have done researches on the field of ICT and its challenging factors, from those, Researchers referred a few research articles. They were in a different context in different countries/ areas and in different time frames. For example

(Lawler, 2007) Conducted a research on "Investing in ICTs in educational institutions in developing countries an evaluation of their impact in Kenya" and he concluded that there should be an immediate development in terms of infrastructure, staff training, private collaboration and internet connectivity.

(Silva., 2007) Did a research on "Information Technology Education in the Sri Lankan School System: Challenges and Perspectives" and he discuss on it about the Introduction of Information Technology into the secondary school curriculum in Sri Lanka is a very recent development. And in this paper he critically analyses the present structure and process of IT education in secondary Schools in Sri Lanka, including aspects of curriculum and teacher training, and attempts to make suggestions to enhance IT education in schools, especially in the context of Ministry of Education's policy to broad-base IT education in schools. And in his other (Silva, 2009) did a research on "ICT Curriculum in Sri Lankan Schools: A Critical Review" and in that he compared the current ICT curriculum and analysed the minimum input requirement for introducing ICT curriculum in Sri Lankan schools.

According to (Haleem, 2012) on his research regarding the Assessment of ICT Use in Government Schools of Kalmunai Central Zone, Sri Lanka, his objective the research is to understand, describe and interpret the availability and usability of ICT in schools as a means to expand and enhance teaching-learning and related administrative tasks in the Kalmunai Central Zone in Sri Lanka. And he found that that ICT facilities and infrastructure are at a poor level, lack of leadership support, inadequate school planning, lack of ICT competency, and negative attitudes towards ICT are major barriers in effective integration of ICT in education.

(Simin Ghavifekr) Did a research on "Teaching and Learning with ICT Tools: Issues and Challenges from Teachers' Perceptions". In that they discusses that "ICT use in the classroom is important for giving students opportunities to learn and apply the required 21st century skills. Hence studying the issues and challenges related to ICT use in teaching and learning can assist teachers in overcoming the obstacles and become successful technology users". Also they has found some key issues and challenges found to be significant in using ICT tools by teachers were: limited Accessibility and network connection, limited technical support, lack of effective training, limited time and lack of teachers' competency. Though out this literature review I have found that there was a few researches has done regarding the challenges of teaching ICT in schools, in Sri Lanka. There is special need to identify the challenges of teaching ICT in Estate Schools. So, this research is an attempt to identify the major challenges on that aspect.



3. Research Methodology

qualitative and quantitative approaches were used for this study to identify the most important challenges in the field of ICT Teaching in estate schools, for this researcher conducted a broad literature survey on secondary data sources such as previous research papers, journal articles, census department statistics and reports, government reports, education ministry circulars and websites on the above context. Also, ICT syllabus books, school class record books, notes of a lesson, education ministry annual reports were used for the extra data collection. And some primary data collection techniques were used such as unstructured interviews and participant observation and direct observation also used for the data collection. In this data collection process grade, 6-9 students were included on to the direct, and participant observation about over 3- 4 month period (about 360 students). And selected 75 students were included in the interview process in that 34 male students and 41 female students were included. Rather than this school principal and some selected teachers also included in the interview.

An in this study, collected data were analysed using thematic analysis method, where the qualitative information was encoded to identify specific themes. Thematic analysis steps suggested by Buraun and Clark (Clarke, 2008) were followed. These steps start by reading and familiarizing with the data, marking initial codes by organizing the data and searching for them by reviewing the data which is collected, and defining and naming those themes.

4. Findings and Discussion

The overall findings suggested that there is a positive attitude to learn ICT among students, but there are some barriers that impact on the process of teaching and learning in the research study area. The research findings offer understandings into the main and powerful factors that affect the process of teaching ICT in Estate Schools. After summarizing the data collected and highlight major points it shows main 3 challenges in this study area. Those challenges are Language Barriers and lack of Knowledge in other key subjects, the insufficient number of periods and poor technological background of the students and Technology Barriers and Fear of Administration.

I. Language Barriers and lack of Knowledge in other key subject

Current Sri Lanka's Education system is student-centred learning, in that system students actively participate more than in the teacher cantered learning system. Because according to Neil Fleming's VARK model in a school system there will be 4 kinds of students. Those are 1. Visual Learners, 2. Auditory Learners, 3. Read and Write Learners, and 4. Kinaesthetic Learners (Fleming, 1995). In the classroom we can find out all these 4 kinds of the students, in my study area, most of the students were visual, auditory and kinaesthetic Learners, obviously there is some read and write learners as well. According to the findings, almost all the students have a positive attitude towards the learning of ICT because most of the modules were a practical basis. But they struggle when they try lean it because according to the curriculum of the ICT they require some basic knowledge in the first language (Tamil), Second Language (English) and some basic mathematics knowledge as well. But in estate schools, most students have poor attainment in these 3 subjects. According to the analysis of the 75 students Exam marks, that show their average marks were very low, according to that their average marks of all 3 subjects (for 100) were: Tamil - 54, English – 20, and Mathematics – 13. According to this, it indicates poorness their language literacy and mathematical knowledge. According to this state students even can't complete the Boom's Taxonomy's first two stages which is remembering and understanding (the basics of the learning). This is the major challenge of teaching ICT in Estate School. The following table and graph show the students marks range in all 3 subjects.

Table 4. Students Marks Range in Three subjects

Marks Range	Tamil	Mathematics	English
0-19	7	59	44
20-39	15	13	24
40-54	13	2	5
55-64	12	0	1
65-74	9	0	0

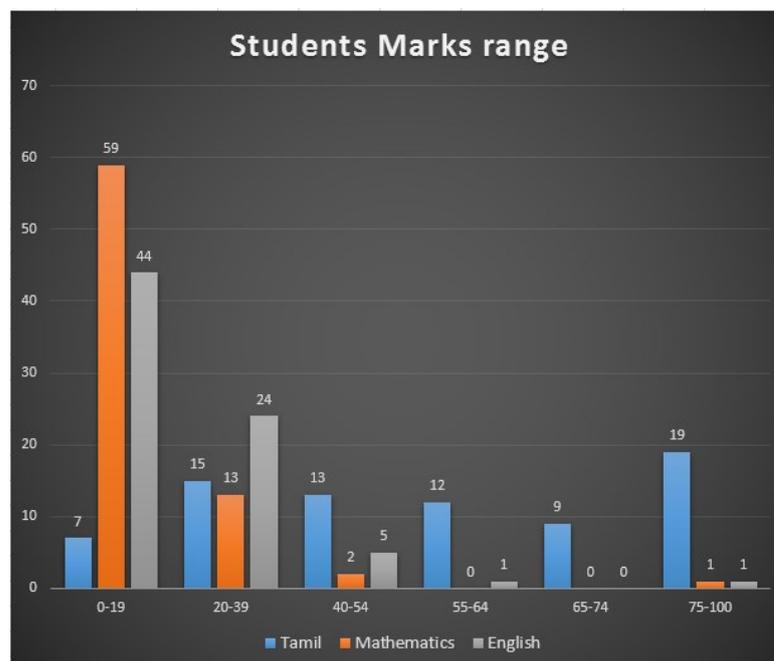


Figure 2. Students Marks Range

This graph indicates that most students exams marks were range between 0 - 39 which is below the pass marks rate. And the pass marks the rate of the student in English and mathematics is very poor. These both subjects were essential to understanding the ICT.

II. Insufficient number of periods and poor technological background of the students

According to the Computer Literacy Statistics of the Department of Census and Statistics in 2018, as discussed in the introduction, that shows that estate sectors have a poor rate of using Desktops and Laptop computers. According to the statistics, their computer usage percentage was continuously decreasing, for instance, their Desktop computer usage in 2016 is 5.0% and when it compares to 2018 its decreased to 2.2 %, it shows that desktop computer usage is decreased by 2.8 %. If look into the desktop or laptop computer usage in 2018 it also only 4.9%. And the observation and interview result of the students also clearly representing this fact. According to these facts, it indicates that more than 90% of estate students don't have a technological background in their home. Because most of the parents were work at estates and tea factories, due to this they don't have enough economic background to afford computers for their children. In a successful teaching and learning environment also plays a main role in it. For example in this set-up ICT teachers can't provide any practical related homework/assignments to the students, this home works /assignments are the main evaluation tool of the teaching process. And teachers can't use the existing school resources as well to improve the students ICT literacy. Because only one period per week is allocated for the ICT subject in the school time table (grade 6 – 9). This one period is not enough for teachers to teach ICT. Because most of the students were doesn't have technological facilities in their home and they already have a poor level of language literacy as well.

III. Technology Barriers and Fear of Administration

One of the main barrier in Estate schools to teach ICT is the technological barriers which are Poor level of ICT facility and infrastructure, Different device capabilities of the computers. The study area this research have a computer laboratory with 40 computers, in that almost 4 computers doesn't work properly, and workable computers were 36. If consider the student amount in a class (from grade 6-9) it almost has 40-50



students per class. If consider the ratio between the available computers and the student amount, there is almost 14 computers were short for the amount of the students. Also, the curriculum of the ICT has some practical module on the internet and email. But school administration doesn't provide internet facility for teaching ICT. Because the administration has a strong perception that to access computers required highly skilled personals, and they afraid that their students will be exposed to adult sites and other undesired sites through the use of the internet. So, they afraid to provide accessibility to the students to use computers. But this presumption and lack of IT resources create many challenges for teachers in teaching ICT in an Estate school. Because most of the students were kinaesthetic and auditory, visual learners. And almost all student doesn't have a technological background. According to this scenario teaching ICT in a theoretical manner is not a productive approach.

5. Conclusion

Information & Communication Technology (ICT) has become a vital technology in the current world. In this information era, we must consider global changes and the demand of participants in education in Sri Lanka. This research aims to explore the challenges of teaching ICT in Estate Schools because identifying the problem is the only way to provide a solution for it. So, this research will help to reduce the resistance towards ICT Teaching in estate schools. Throughout this study, I have introduced and analysed some factors that influence the ICT teaching and learning process in estate schools. Throughout this, I have found 3 influencing factors. Those were language barriers, technological barriers, and administrative barriers, insufficient number of periods and poor technological background of the students. Through this, I have found that students have a positive attitude towards ICT Learning, but their poor attainment on other subjects such as English and mathematics influence on the learning process of ICT. With student's incompetency, administrative barriers and technological barriers also massively impact on the ICT teaching at estate schools. Lack of motivation towards the students' learning and lack of awareness about the importance of the learning ICT and its potential benefits which may lead to the success of the students' future were some key reasons. I hope the findings will contribute towards resolving the challenges of teaching ICT in Estate schools in Sri Lanka.

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