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Use of Information Communication Technology by School Teachers in Information Provision: An analysis of Sri Lankan perspective

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Abstract

The study examines the use of ICT by school teachers in Sri Lanka and it intends to understand the knowledge of ICT and the use of ICT for their information provision. The survey method was adapted and the questionnaire used as the main data collection tool for the study. The results revealed that the most preferred information source was a colleague followed by personal knowledge or experience ranked second and professional books ranked third with high preference level. With regarding the level of confidence of ICT, the results showed that the highest skill or application in the teachers' responses was utilizing the basics of operating the ICT while managing files was second with high arithmetic mean which implying a higher degree of convergence among teachers at this level. The results further established that there was a positive relationship between use of ICT in teaching and teaching methods by the school teachers. In terms of ICT facilities available in schools, even majority of schools had ICT laboratories, only 11% had well-resourced in terms of infrastructure facilities. With regarding the ways of access to the internet more than half of them accessed from their modems while 18% accessed from private cyber cafes and 15% accessed from their school's ICT laboratories. With regarding the internet search, nearly two third of teachers reported that they had ever searched on the internet for a topic but only 41% mentioned that information retrieved from the internet was either relevant or very relevant to their topics. Majority of teachers used Google as search engine to access the internet while 76.4% had not received any training on ICT. Based on the findings and the conclusion, the recommendations were made.

Key Words: Use of ICT, School teachers, Information provision, Teaching, Sri Lanka

1. Introduction

Information & Communication Technology (ICT) has become the state of the art technology of the modern world and the ICT is seen as a superhighway on which information is transmitted and

shared by people across borders. The advent of new global economy has had serious implications for the nature and purpose of educational institutions. Access to information continues to grow day in day out such that the school cannot continue to be places for the transmission of an approved set of information from teacher to student over a period of time. Schools must instead be seen as places that promote knowledge acquisition and skills that will enable people to continuously learn over the lifetime. As a result of this, ICTs which include radio and television, and the Internet - have been hyped as potentially and powerful enabling tools for educational change and reform (Hennessy et.al 2010). ICT according to Ajayi and Ekundayo (2009) is simply about sharing and having access to data easily with the use of ICT tools such as computers, printers, internet and many others. In other words, ICT is seen as a superhighway on which information is transmitted and shared by people across borders. The field of education has been affected by the penetrating influence of ICT.

However, the success and failure in achieving quality education lies primarily on teachers (Mangaleswarasharma, 2017) as the actual implementation of the education programs at whatever level rests in their hands. (Wijerathne, 1989) The teacher is very important factor in education system because he brings curriculum to real practice in the classroom and manages learning activities. His /her teaching effectiveness depends on his/her knowledge, ability, experience and teaching methodology. It is certainly true that skillful teacher can attract students' interest and effectively support students' learning (Barber, 2007; Panich, 2012). Moreover, educators at all levels (primary, secondary, tertiary and professional) have been exerting efforts to enhance information literacy among all ages by developing strategies and policies that enable efficient use of ICTs , which in turn would make learners experience more effective information practices (Bruce 2004). In order to ensure the success of any strategy or initiative, it is important to identify the factors influencing the information-provision.

Moreover, teachers must be aware of the fact that the digital age has changed the way information is created, collected, and communicated. Library services has now become automated and information services, electronic. All users of information including teachers must learn new knowledge and skills in order to be able to use ICT tools to satisfy their information needs. This is because with the advent of ICT, information could be accessed irrespective of the day, time and circumstance. Knowledge in ICT by teachers will go a long way to help them. This is because in a situation where the teacher's information need is not met at the library or an information center, he or she can fall on the internet to obtain the needed information for teaching.

On the other hand, effective teaching is essential for effective learning and the process of teaching has become more complex at present because of advancement of ICT. (Shanmugam, 1999) Computers and computing methods are playing significant roles in education. The Association for Teacher Education in Europe (ATEE) reports that information technology has brought new ways of handling information, especially data carrying information. The new ways of information processing are connected with new thinking methods and new problem solving approaches. Therefore, literacy in information technology is needed for teachers (IFIP, 1976; Peter, 1984). Teachers in all disciplines need certain background knowledge and skills in information seeking to incorporate the ideas and techniques of information processing into their teaching. Teachers need to know how to retrieve, evaluate and utilise information derived from

various sources. The proliferation of information and the higher expectations from employees has made education and training a life-long process and schools to develop students as independent learners. Increasingly students should be responsible for their own learning. Students should have their own mind and teachers have to make sure, they have the necessary skills to do so. Teachers, as a result have to move away from text based approaches of teaching to resource based instructions as well as student centred learning in order to develop independent learners for life. In creating this knowledge culture, the teachers themselves need to internalise and practice the habits and values related to learning and acquiring knowledge. The teachers can then serve as role models having the love for learning as well as the ability and skills that are essential in acquiring information and teachers must be initiators of changes and they must ensure that the reforms permeate to the lower levels.

When ICTs are used appropriately, it helps enlarge access to education, fortifies the importance of education to all and sundry and raises the quality of education by helping make teaching and learning active and more engaging. Therefore this study examines the use of ICT by school teachers in Sri Lanka. It is a step towards understanding the ICT knowledge of school teachers and the use of ICT in process of teaching and has broader implications for how they acquire new knowledge in information seeking process.

2. Research Objectives

The purpose of the study was to examine the use of ICT in information provision by school teachers in Sri Lanka. The overall objective for the study is to examine how school teachers in Sri Lanka acquire and use information using ICT facilities available from schools. The specific objectives of the study are as follows:

1. To examine information resources used by school teachers in information provision
2. To investigate use of ICT by teachers for teaching and learning purposes
3. To explore how ICT affects teachers' confidence in the classroom.
4. To investigate use of Internet for teaching

3. Research Questions

To address the research objectives, the study seeks to answer the following questions;

1. Which information sources are mostly used by school teachers in Sri Lanka?
2. How confident are teachers in using ICT in the teaching and learning process?
3. Which ICT facilities are available and are used by the teachers?
4. How do teachers use Internet in teaching?

4. Review of Related Literature

A number of studies have been conducted to examine ICT use by schoolteachers. Findings revealed that, the use of ICT in teaching is very advantageous. Aribisala (2006) was of the view that ICTs are increasingly playing an important role in organisations and society's ability to produce access, adopt and apply information. The uses of ICT's have made the sharing and transfer of information from even the remote areas possible. Teachers are not excluded from these benefits. ICT helps teachers to share information amongst themselves, to their students and even amongst those in the rural areas with the help of then ICT tools. According to Volman and Van Eck (2001), the use of ICT creates a powerful and interesting learning environment and it changes the learning and teaching process in which students deal with knowledge in an active, self-directed and constructive way.

The proliferation of technology has complicated the teaching-learning process and finding the best ways of integrating technology into classroom practices is one of the challenges 21st -century teachers' face. Effectively integrating ICT into learning systems is much more complicated than providing computers and securing a connection to the Internet (Afshari, et al., 2009:20). The Internet has become an indispensable requirement for every teacher because it gives them the ability to work with multimedia, and thus enhance interactive activities in the classroom environment. The Internet is also the fastest growing educational tool. The overwhelming amount of publicly available information on the web is increasing consistently at a mind-boggling speed. It has turned into a gigantic electronic library. It is therefore important for teachers to embrace this new technology by acquiring basic and advanced skills of information literacy (Singh & Jindal, 2009:430). It is clear that the internet technology has become an effective means for widening educational opportunities, but most teachers neither use the technology as an instructional delivery system, nor integrate the technology into their curriculum (Afshari, et al., 2009:1). In view of the above, there is a need for government to reinforce learning by reducing inequalities in educational development through the availability of ICT tools in educational institutions to enhance the competence and innovation of teachers in order to take full advantage of the potential of digital devices to improve thinking skills and thus learner performance (Ndlovu & Lawrence, 2012: 1).

Little research has been conducted on teacher trainees' conceptions of using the Internet in information literacy instruction. (Tanni, Sormunen & Syvänen, 2008) Some studies on information literacy instruction have revealed some problems related to teachers' difficulties in developing strategies and practices that work in the new information and media environment. For example, Limberg and others (2008) summarized the findings of several studies and argued that teachers' focus on low-level skills frames information literacy as pressing the right keys and finding the right pages or web portals. For meaningful learning it would be important to support high-level aspects of information literacy like formulation of research questions and critical evaluation of information. However, the discursive practice of the school shapes the view of information seeking and learning as fact-finding (Limberg, 2005).

Madden and other (2005) conducted a survey on practicing teachers' conceptions of using the Internet in teaching. The results show that younger teachers had more experience in using the Internet than older teachers. The older teachers found it difficult to use search engines, were less confident in their ability to use the Internet, less convinced of its importance in teaching, used it less with classes, felt under more pressure to use the Internet, believed that students know more than they do about the Internet and had more confidence in students' ability

to use the Internet to search for information (Madden et al. 2005). Moore (2002) reports on a study of practising teachers who had difficulties in distinguishing between relevant and irrelevant information and perceived themselves as more able to use the old rather than the new technologies. The findings of the study reported that the teacher trainees' did not consider the use of the Internet as a challenge, even though they were aware of the problems in achieving their search goals with the new technology.

Ajayi and Ekundayo (2009) posits that the role of education in nation building and the population explosion in the secondary schools these days has made the use of ICT in the teaching-learning process vital. This is because the adoption of ICT by the teachers will enhance effective teaching in terms of good course organisation, effective class management, content creation, self-assessment, self-study collaborative learning, task oriented activities, and effective communication between the teachers and research activities will be enhanced. This effective teaching results from the fact that teachers will be well informed so their confidence level will be high thereby making them able to deliver. Tella (Tella et. al, 2007) conducted a study on Nigerian secondary school teachers on uses of ICTs and implications for development of ICT use in schools. The findings revealed that most teachers considered ICT as a very useful tool since it makes teaching and learning easier. This is because teachers are able to acquire enough information through the use of the internet for their lessons and therefore feel confident to stand before their students to teach. They therefore recommended that professional development policies assist ICT-related teaching models, in especially those that help both students and teachers to take part in the teaching activities. They further added that emphasis should be placed on the pedagogy underlying the use of ICTs for teaching and learning. That is much attention should be given to the method of ICT use for teaching so that learning could be enhanced.

Research and active development projects such as those run by EdQual, a Research Consortium of educational institutions in the UK and Africa on educational quality indicated two main reasons why teachers use ICT. Firstly, they feel that their own use of computers benefits their learners because teachers saw ICT as a motivator that motivates students' interest and learning in the subject. ICT encourages a positive attitude towards information technology as an essential part of a lifelong interest in learning. Secondly, teachers feel learners benefit from using ICT's themselves. It has been seen as sequencing way of learning properly, and provides access to a rich source of information. Teachers also saw the use of ICT as a way of increasing students chances of recall of previous learning, providing new stimuli, activating the learner's response, and providing systematic and steady feedback. Looking at what has been mentioned earlier; there can be an agreement with Cox (Cox et. al, 1999) that the factors contributing to ongoing use of ICT by teachers include: making lessons more exciting, more enjoyable for teachers and their students, more diverse, more motivating, and supportive of productive learning.

The use of ICT creates a significant learning environment, and it changes the learning and teaching process in which students deal with knowledge in an active, self-directed and constructive way (Volman& van Eck, 2001:613).As a classroom tool, the computer has captured the attention of the education community. This versatile instrument can store, manipulate and retrieve information, and it has the capability not only of engaging students in instructional activities to increase their learning, but of helping them to solve complex problems to enhance their cognitive skills (Jonassen& Reeves, 1996:693).

Apparently, teachers' acceptance for new technologies seems to be controversial. Whilst some have effectively integrated ICT tools into the classroom, others have been cautious in their acceptance, and some have simply rejected these technologies. Of course, the role of the teacher in terms of using ICT must change so as to enable them cope with the recent developments. Literature reviews in this field are important not only to teachers but also to policy makers who undertake supporting teachers in implementing ICT inside the classrooms. In this respect, Beauchamp and Kennewell (2008) found that teachers need to draw upon large volumes of suitable resources that they can draw on for specific targets and adjust to meet the requirements of the students. However, students need to have a level of ICT skills in order to deal with technology, and teachers should help the students with important tasks rather than waiting for the students to „push computer buttons in response to easy questions from the teachers'. Accordingly, this means that the teacher has to be pro-active and confident with the technology themselves.

In order to clarify the teacher's role in implementing ICT in the classroom, some researchers considered the teacher's competencies related to ICT, for example, Nico, Ruttena and Wouter (2012) demonstrated that the use of computer simulations while teaching in the classroom will not be successful unless teachers have the necessary skills and information to implement them effectively. In addition, they reported that if teachers do not have the skills, the potential learning from computer simulations will remain out of reach. As an alternative, they may be used as demonstration experiments or be totally controlled by the teacher. In other words, the role of the teacher should focus on founding a pedagogical framework necessary for implementing computer simulations during teaching science. Some researchers investigated the difficulties that teachers may encounter while implementing ICT. They revealed that the difficulties in the use of ICT are related to the weakness of a teacher's knowledge about what technologies are available and how they can be used in the educational process in the classroom. In addition, teachers should know how to use ICT in relevant ways to help them in the delivery of the curriculum (Morrisa, 2011). As solution for this problem, it is necessary that teachers need to feel confident in their skills to assist student learning with technology, to incorporate technology into their classrooms. Therefore this needs to become a more qualified development to increase a teacher's skill (Ward and Parr, 2010).

With respect to ICT environment, Chen and Wu (2012) note that the teachers should provide opportune help which should focus on how the students can learn and explain to them that making mistakes in the lessons is part of the learning process. Furthermore, the ICT environment should focus upon how erudite the material is in relation to reality so that the students learn how to improve their skills and achieve the knowledge. Similarly, Mukama & Andersson (2008) point out that learning in ICT environments is similar to a journey and teachers newly entered into the profession often provide new visions. Likewise, in a study by Su (2011) suggested that ICT-integrated environmental learning can support students to achieve a greater understanding of a chemistry lesson and improves their attitude and approach to chemistry learning. However, these studies emphasise the importance of providing effective ICT environment for students by teachers.

Similarly, Kubiatico and Halakova (2009) analysed age and gender variables in relation to ICT teaching in nine high schools in Slovakia and divided their questionnaire-style survey into five areas. These explored the positive and negative influences of ICT, the advantages of ICT use, use of ICT in biology lessons and the disadvantages of using ICT. Male students were found to have more positive attitudes towards the use of ICT than their female counterparts and the younger students were more positive about ICT use than the older students. In the UK, Ruthven, Hennessy, and Deaney (2005) examined the pedagogical perspectives and strategies of eight teachers attempting to integrate ICT and Internet use into their lessons. Each of the five projects they undertook had distinctive features so that Internet resources were used in lessons. Pupil access to the internet was supported and structured, students were engaged in the process and a sense of capability was developed. Therefore current literature shows that many countries are moving towards a new paradigm, yet evidence continues to be mixed in terms of its impact.

In the Sri Lankan context, very few studies conducted on the topic and will be analysed three of them which are mostly relevant for the present study. The study conducted to investigate individual and organizational factors affecting the effective use of ICT among ICT facilitated secondary schools in the North Central Province of Sri Lanka by Palagolla (2009) found that low level of ICT integration over seventy one percent of respondents (teachers) of the survey. A fairly notable variation was found in the extent to which respondents use ICT for both information knowledge creation and dissemination against information knowledge storage and applications at work. Majority of the respondents show low level of ICT competency, which highlights lack training opportunities on task-technology fit. The results revealed that ICT infrastructure, leadership support, and school planning as major constraints of this scenario. In contrast, respondents' fairly positive attitudes towards ICT have been a positive remark on future developments. (Palagolla, 2009)

In a study carried out (Suraweera *et al*, 2017) to examine teachers' perspectives on factors contributing to ICT integration in teaching in Sri Lankan schools found that ICT skills and attitudes of teachers and organizational factors as critical factors that mainly affected to the ICT integration in Sri Lankan school. In another research study conducted to explore the educational challenges and opportunities for ICT education in Sri Lanka found that lack of computer laboratory and cost of devices, lack of qualified ICT teachers, less motivation towards ICT among school children, lack of funds for the implementation and maintenance of computer laboratories, inadequate knowledge in English (language barrier), ICT is not a major subject in the school curriculum, no National Level Certification for ICT for students as major challenges for ICT education in Sri Lanka. Rising demand for the ICT sector career, high literacy rate of the citizens, properly established and scattered schools provide easy access to the school community, public- private sector partnership, government and INGOs projects are identified as opportunities for the ICT implementation in Sri Lanka (Ilmudeen, 2014)

5. Methodology and Procedure for Data Collection

For the current study, the researcher surveyed all postgraduate student teachers who enrolled to follow postgraduate courses conducted by the Department of Education in the University of Peradeniya, Sri Lanka. Survey method was adapted for the study and a questionnaire was used as

the main data collection tool for the study. A structured questionnaire specially designed for the study was distributed among the participants early September in 2018 and the data were statistically analysed using SPSS software package version 21.0.

6. Data analysis and findings

6.1 Demographic and professional characteristics of sample

Total population of 440 postgraduate students in the Department of Education was surveyed and 318 responded making a 72.2% response rate. Table I provide the demographic and professional characteristics of the respondents according to the following variables: Gender, Age, Highest educational qualification, Number of years in teaching, Attended any ICT training courses on e-learning (N=318)

Table 1: Demographic and professional characteristics

	About respondents	Frequency	Percentage
1	Gender		
	Female	235	74.0
	Male	83	26.0
2	Age		
	26-30 years	08	2.6
	31-35 years	106	33.5
	36-40 years	132	41.1
	More than 40	72	22.8
3	Teaching experience		
	1-5 years	81	25.4
	6-10 years	162	51.4
	11-15 years	46	14.5
	16-20 years	25	7.6
	More than 20	04	1.1
4	Highest educational qualification		
	Master's degree	45	13.6
	Bachelor degree	208	65.7
	Post graduate Diploma	65	20.7
5	ICT Course followed		
	Yes	167	52.8
	No	151	47.2

It is revealed from Table 1, 74% of the respondents were female while 26% were male. In terms of the teachers' age distribution, the highest representation was from the age group 36-40 years with a rate (41.1%), then the 31-35 age group (33.5%), followed by more than 40 age group (22.8%) and the 26-30 age group (2.6%). In terms of teaching experience, more than half (51.4%) of the respondents had worked for 6-10 years, followed by 25.4% having 1-5 year experience while 14.5% had 11-15 years and 7.6% had 16-20 experience. With regarding the highest educational qualification obtained, the majority (65.7%) had bachelor degrees followed by 20.7% had postgraduate diplomas and 13.6% had masters degree. In terms of teachers' ICT

courses in the field of e-learning, the major proportion was for those who received training in the field of e-learning with a rate of 52.8%, and 47.2% did not receive training in the field of e-learning. Thus far, the research has considered the relevant literature, the general background to the study and the methodology undertaken in gathering the data. Now, the data is analysed with a view to answering the research questions are formed in the study.

6.2 Preferred information sources of school teachers

Based on one of the objectives of the study which was to determine the information sources that were preferred by the school teachers, respondents were asked to indicate preferred sources of professional information that used for teaching. In order to determine the level of preference of information sources arithmetic means, standard deviations, rank and preference level were calculated. Table 2 shows the results associated with preferred information sources, where they were invited to rate that preference on a Likert scale of 1-5, from 'Not At All Preferred' (1) to 'Extremely Preferred' (5) for a range of information sources used

Table 2: Preferred information sources

	Information sources	Mean	Standard Deviation	Rank	Level of preference
1	A colleague (i.e., another teacher)	4.11	0.863	1	High
2	Personal knowledge/ experience	4.09	0.976	2	High
3	A professional book (Text book, Teachers guide etc.)	4.01	0.987	3	High
4	Someone with expertise such as a learning resource specialist or consultant	3.88	1.019	4	Medium
5	Government publications	3.61	1.094	5	Medium
6	From Internet	3.54	1.082	6	Medium
7	From library	3.49	1.159	7	Medium
8	Popular magazine	3.21	1.191	8	Medium
9	Newspaper	3.08	1.193	9	Medium
10	A presentation, work-shop, in-service training or professional conference	2.84	1.216	10	Low
11	An additional qualifications or educational /post-secondary course	2.84	1.177	10	Low
12	A television program, video, CD,DVD	2.78	1.306	11	Low
13	A research journal or journal article	2.69	1.244	12	Low
14	Your principal, vice-principal, or supervisor	2.47	1,216	13	Low
15	Reference sources	2.29	1.179	14	Low

(Encyclopedia, Hand book, Dictionary etc.)				
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The study has applied the levels as follows: The degree of preference is classified as high when the arithmetic mean ranges between (4 to5), medium when the arithmetic mean ranges between 3 to 3.99 and low when the arithmetic mean ranges from1 to 2.99.

As revealed in Table 2, the preference level of school teachers' information resources is varying among different resources. The results also show that the most preferred information source was a colleague (i.e., another teacher) where the arithmetic mean was 4.11 and the standard deviation of 0.863. Personal knowledge or experience ranked second where the arithmetic mean was 4.09 with a standard deviation of 0.976 implying a lesser degree of convergence among teachers at this level. A professional book (Text book, Teachers guide etc.) ranked third where the arithmetic mean was 4.01 with a standard deviation of 0.987 with high preference level. Someone with expertise (i.e. a learning resource specialist or consultant), Government publications , Internet , library , Popular magazine and Newspaper ranked 4,5,6,7,8 where arithmetic mean scores were 3.88,3.61,3.54,3.49,3.21 and 3.08 respectively with medium level preference. Reference sources such as Encyclopedia, Hand book, Dictionary etc. were ranked fourteenth with the lowest level of preference showed where the arithmetic mean was 2.29 with a standard deviation of 1.179.

6.3 ICT Confidence amongst school teachers

The level of ICT use among teachers is considered to be the basis for identifying the degree of ICT skills they possess and can implement across the curriculum, or in ICT itself. In order to determine the level of ICT usage among teachers, arithmetic means, standard deviations, rank, mode, frequencies, and percentages regarding ICT skills and its applications were calculated. Table 3 shows the results associated with teachers ICT confidence, where they were invited to rate that confidence on Likert scale of 1-5, from 'Very unconfident' (1) to 'Very confident' (5) for a range of ICT skills or applications.

Table 3 : ICT Confidence of School Teachers (N=318)

	ICT Applications	Mean	Standard Deviation	Rank	Level of use
1	Basics of operating PC (using keyboard, mouse etc.)	4.59	0.976	1	High
2	Managing files (delete, move to, etc.)	4.52	1.018	2	High
3	Using word processor such as word program	4.45	1.045	3	High
4	Using chat rooms and forums (Facebook, Twitter)	4.29	1.094	4	High

5	Searching for information on the Internet	4.25	1.082	5	High
6	Downloading files from the Internet	3.74	1.159	6	Medium
7	Using Email (reading and sending emails)	3.60	1.193	7	Medium
8	Using PowerPoint software	2.49	1.216	8	Low
9	Using data show basis on PC as projection tool	2.09	1.176	9	Low
10	Deleting or editing pictures, animations or movies	2.03	1.244	10	Low
11	Searching for saved data on hard disk or hard disk	1.87	1.216	11	Low
12	Combining files from different resources (sound or video files) to create presentations	1.71	1.179	12	Low
13	Use spreadsheet processor (such as excel program)	1.64	1.219	13	Low
14	Using digital camera	1.63	1.209	14	Low
15	Creating or Using data base processor (such as access program	1.59	1.095	15	Low
16	Producing learning software	1.22	1.114	16	Low
17	Publishing a personal blog	1.13	1.153	17	Low
18	Using different designing programs (Photoshop, Flash)	1.09	1.126	18	Low
19	Designing web page or personal web site	1.02	1.307	19	Low

Again, the study was applied the levels based on those previously describe: The degree of use is classified as high when the arithmetic mean ranges between (4-5), medium when the arithmetic mean ranges between (3-3.99) and low when the arithmetic mean ranges between (1-2.99).

It is notable from Table 3 that the level of teachers' confidence in using ICT and its applications is varying among different applications. The results also show that the highest skill or application in the teachers' responses was utilising the basics of operating the ICT (such as using the keyboard, mouse, etc.)where the arithmetic mean was 4.59 and the standard deviation

0.976. Managing files was second, where the arithmetic mean was 4.52 with a standard deviation (SD) of 1.018 implying a higher degree of convergence among teachers at this level. Using word processor such as word program, using chat rooms and forums (Facebook, Twitter) and searching for information on the Internet ranked 3, 4, and 5 where the arithmetic mean scores were 4.45 (SD=1.045), 4.29 (SD=1.094) and 4.25 (SD=1.082) respectively. The results further established that downloading files from the Internet and using Email (reading and sending emails) ranked 6th and 7th where the arithmetic mean scores were 3.74 (SD=1.159) and 3.60 (SD= 1.193) with medium level of confidence.

The lowest level was among teachers was confidence in designing web pages or personal sites and using different designing programs (Photoshop, Flash) where the arithmetic mean was 1.02, 1.09 with standard deviation of 1.307, 1.126 respectively highlighting a greater disparity among teachers at this level. The teachers' level in using PowerPoint software, using data show basis on PC as projection tool and deleting or editing pictures, animations or movies ranked slightly better, with an arithmetic mean of 2.49 (SD=1.216), 2.09 (SD=1.176) and 2.03 (SD= 1.244) respectively.

6.4 Relationship between the use of ICT in teaching and teaching methods

Teachers were also asked to assess the extent to which the use of ICT in teaching practice affects their teaching. The results indicate that the teachers believe there is a positive relationship between the use of the ICT and its applications for their teaching where the arithmetic mean was 3.56 with a low standard deviation of 0.762. The percentages of responses are presented in Figure 1 below.

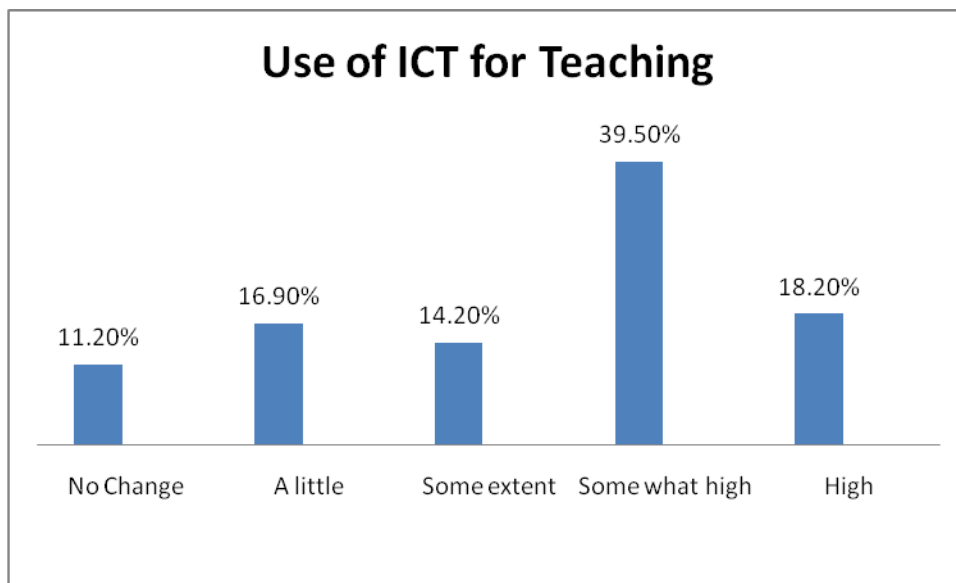


Figure 1: Relationship between use of ICT in teaching and teaching methods

As explicit in the Figure 1, the highest response was “Somewhat high” with 39.5% response rate followed by 18.2% indicated “high” and 14.2% mentioned “some extent” which gave an

insight that there is a positive relationship between use of ICT in teaching and teaching methods and school teachers.

6.5 The Perspective of Teachers on use of ICT for teaching

The attitudes of teachers on use of ICT and its application in the teaching process are regarded essential in order to provide ICT facilities that needed for effective information provision. No progress could be attained unless the teacher is positive about the need technology into the classroom. Therefore the present study examined the advantages and disadvantages related to implementing ICT in teaching process from the perspectives of teachers.

Teachers were asked to mention their agreement or disagreement with a series of positive (advantageous) or negative (disadvantageous) statements given in the questionnaire. Table 4 shows the results associated with teachers perspectives, where they were asked to rate that agreement/ disagreement on a Likert scale of 1-5, from 'Strongly Disagree' (1) to 'Strongly Agree' (5) for the given statements. Arithmetic means, standard deviations and rank, related to skills of using ICT and its applications were calculated are shown in Table 4.

Table 4: Advantages and disadvantages of using ICT in teaching method

	Advantages and disadvantages of using ICT in teaching	Mean	Standard Deviation	Rank	Level of use
1	ICT makes teaching more interesting for me	4.64	0.982	1	High
2	ICT makes my lessons more diverse	4.37	0.978	2	High
3	ICT has given me more confidence to extend my use of ICT to other topics	4.13	1.021	3	High
4	ICT improves the presentation of material in my lessons	3.69	1.094	4	Medium
5	I find it easy to think of ways to use ICT in my teaching	3.52	1.074	5	Medium
6	ICT makes preparing lessons quicker	3.48	1.167	6	Medium
7	ICT makes preparing lessons more difficult	3.02	0.967	7	Low
8	ICT limits the content of my lessons	2.39	1.109	8	Low

9	ICT makes it more difficult to control the class	2.21	1.123	9	Low
10	ICT decreases students' motivation	2.18	1.078	10	Low

The results from Table 4 indicate that the highest advantages for implementing ICT in the teaching process was “ICT makes teaching more interesting for me” where the arithmetic mean is 4.64 with standard deviation of 0.982, implying convergence amongst respondents. Secondly, “ICT makes my lessons more diverse” was the next advantage, with a mean of 4.37 and standard deviation of 0.978, followed by “ICT has given me more confidence to extend my use of ICT to other topics” was next advantage with a mean of 4.13 and standard deviation 1.021. The results are confirmed with two studies conducted in Sri Lanka which found that school teachers had fairly positive attitudes towards ICT that has been a positive remark on future developments. (Palagolla, 2009; Suraweera *et al*, 2017)

The most significant disadvantage given by respondents that can arise as a result for using ICT in the teaching process was “ICT makes preparing lessons more difficult “where mean score was 3.02 with a standard deviation of 0.967. The next most significant disadvantage shown in the results was “ICT limits the content of my lessons” with a mean of 2.39, a standard deviation of 1.109 implying a high level of divergence.

6.4 Available ICT facilities for teachers

The present study intended to find out the role of ICT played in information provision to school teachers for teaching purposes. In order to get clear picture of ICT facilities available in schools few questions were asked in the questionnaire. The first question sought to know whether the schools had ICT laboratories and two hundred and fourty six respondents (77.3%) indicated that they had ICT laboratories in their schools while seventy two respondents (22.7%) mentioned there were no ICT laboratories in their schools. The respondents who recorded that they had ICT laboratories in their schools were further asked whether their ICT laboratories were well resourced in terms of infrastructure. It was revealed that, the laboratories were not well-resourced in terms of infrastructure as attested by two hundred and nineteen respondents (89%) and only twenty seven respondents (11%) indicated that their laboratories were well-resourced in terms of infrastructure facilities available at school. The findings are confirmed the previous research conducted by Ilmudeenn(2014) which identified that lack of computer laboratory, cost of devices and high cost of implementation and maintenance of computer laboratories as challenges faced in school education in Sri Lanka.

6.4.1 Availability, usability and accessibility of ICT in schools

In order to get in depth analysis of ICT resources usage, the teachers were asked to indicate whether ICT resources given in the questionnaire are available for use at school as a teacher and whether they have used them. Further they were asked to indicate whether they found them to be easily accessible if they have used these resources.

Table 5: Availability, usability and accessibility of ICT resources at school

	ICT Resource	Availability		Usability		Easy Accessibility	
		YES	NO	YES	NO	YES	NO
1	Desktop/laptop computer for personal use	52	266	36	16	17	19
2	Notebooks for Teachers Program	21	297	17	04	11	06
3	Personal email account	82	236	54	28	22	32
4	School intranet	11	307	07	03	04	03
5	Internet	101	217	76	25	22	54
6	Printer	74	244	57	17	32	25
7	Digital cameras	89	229	56	33	21	35
8	Specialist software applications (eg. CAD, HTML editors etc.)	09	309	08	01	05	03
9	Digital projectors/interactive whiteboards	142	176	87	55	41	46
10	Technical support	07	311	06	01	06	00

As revealed in Table 5, fiftytwo (16%) respondents indicated the availability of computers (desktop/laptop) for their personal use in school but from them only 36 (69%) of them have used, the reason may be lack of accessibility i.e. only 17 (47%) of users have accessible for the computers. The results further revealed that eighty two respondents (25.7%) have personal email accounts, from them only 54 (65.8%) have used in the school while 32 respondents (59.3%) who used email did not access at school because of not easyaccessibility. It is notable that one hundred and one respondents (31.2%) mentioned the availability of internet in the school but from them only 76 (75.2%) mentioned that they used the internet in the school while 54 (71%) mentioned accessibility is not easy at school. Regarding digital camera and printer, 89 (27.9%) and 74 (23.3%) of the respondents respectively mentioned availability of these resources in the school, but usability and accessibility is quite low. It interesting to note that the availability of digital projectors or interactive white boards in school are quite high when compared to other ICT resources but the usability (87) and accessibility (41) of them also very much less which should be think about critically.It was apparent from table 5, that even though substantial amount of ICT resources are available in schools,their usage and accessibility is very much low.

6.5 Use of Internet for teaching

The study examined the way of teachers accessed the internet in search of information that require for teaching. Respondents were asked to indicate their source of internet and the responses given are shown in Figure 2.

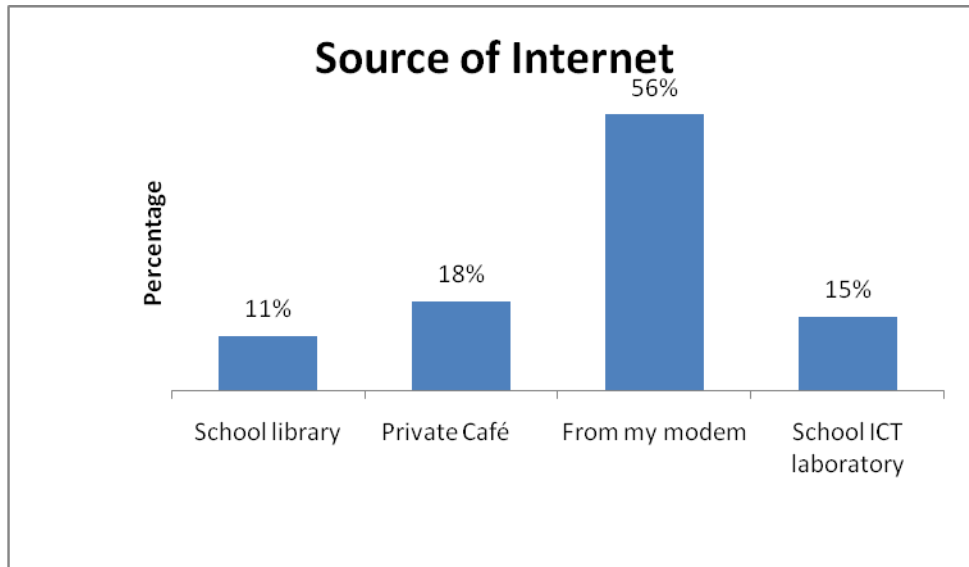


Figure 2: Source of Internet for Teachers

As shown in Figure 2, one hundred and seventy eight (57%) of the respondents indicated that they had access to the internet from their modems, Fifty seven (18%), of respondents said they had access to the internet from private internet cafes whilst forty eight (15%) of the respondents indicated that they had access to the internet from their school's ICT laboratories. It is further revealed that only thirty five respondents (11%) accessed to the internet from the school library.

To add to the findings obtained on how respondents got access to the internet, they were further asked whether they had ever searched on the internet for information on a topic and retrieved results. Out of three hundred and eighteen respondents, one hundred and ninety seven (62%) respondents, said they had ever searched on the internet for a topic and received results while ninety five (29.38%) respondents mentioned that had not searched and twenty six (8.2%) had not given any response.

6.5.1 Relevance of information obtained from the Internet

In addition to finding out whether respondents had ever searched for information on the internet, the study examined the degree of relevance or irrelevance of the information retrieved from the internet by the respondents and Table 7 presents the responses given in relation to that question.

Table 7: Relevance of information received from the internet

	Degree of relevance or irrelevance	Frequency	Percentage
1	Very relevant	68	21.4
2	Relevant	88	27.7
3	Irrelevant	21	6.6
4	No response	141	44.3
	Total	318	100

Table 7 shows that, eighty eight (27.7%) respondents indicated that information retrieved from the internet was relevant to their topics while sixty eight (21.4%) respondents also indicated that information retrieved from the internet on a topic they ever searched was very relevant. Only twenty one (6.6%) respondents indicated that information retrieved from the internet on a topic was irrelevant while majority of them (44.3%) have not responded.

6.5.2. Search Engines Used by Teachers

The study investigated these search engines which are software systems designed to search information from the internet are used by the teachers when seeking information for teaching.

Table 8: Use of search engines (Multiple responses allowed)

	Search engine used	Frequency	Percentage
1	Google.com	189	59.4
2	Wikipedia	97	30.5
3	Yahoo.com	52	16.3
4	Ask.com	39	12.3
5	Webcrawler.com	21	6.6
6	Ultra Vista	08	2.5
7	No response	119	37.4
	N= 318		

As shown in Table 8, out of the sample of three hundred and eighteen one hundred and eighty nine (59.4%) respondents, indicated that they used google.com, followed by ninety seven (30.5%) used Wikipedia while fifty two (16.3%) used Yahoo.com and thirty nine (12.3%) used Ask.com as search engine for their internet search. It can be deduced from the analysis that, majority of the respondents used google.com as their search engine. Anyway this result is affirmed with two similar studies conducted by Kumar (2013) and Ahenkorah-Marfoet. *al* (2011) which found that the majority of academic scholars preferred Google search engine because it has maintained its position in providing information on the internet.,

6.6 Training on ICT use for teachers

As a follow up question, respondents were asked whether they had had any training on ICT as to how to search for and retrieve relevant information that require for teaching. The results established that seventy four (23.2%) respondents mentioned that they had training on the use of ICT while majority, that is, two hundred and forty four (76.7%) respondents mentioned that

they had no training on how to use ICT to access relevant information. It could be deduced that majority of the respondents had not received any training on ICT use.

7. Conclusion

The results show that the most preferred information sources of school teachers were colleague, personal knowledge or experience and professional books which were rated as high in use. Teachers' responses reflect a general confidence in ICT use, especially for the most basic and intuitive PC , Managing files ,Using word processor such as word program and using chat rooms and forums (Facebook, Twitter) and searching for information on the Internet ranked top with high mean scores. In spite of teachers' lack of ICT use, they are quite positive about the potential impact of ICT, and the advantages of using ICT. When analysed the findings it clearly revealed that teachers believe that ICT can have a positive impact on teaching and learning. As revealed in the results more than seventy percent of teachers mentioned that there is a positive relationship between use of ICT in teaching and teaching methods. In terms of potential impact, most of the teachers described the extent they believed ICT changes their teaching methods. This clearly describes a situation where teachers believe ICT can change the nature of learning in the classroom, for good or bad. When invited to contextualise the nature of that impact, teachers were favourable about the advantages associated with ICT and generally disagreed with any negative statements. The results established that the teachers agreed most strongly with the statements which are a reflection of the "technical" or motivational aspects as outlined in the research, over any prevailing „pedagogical“ motives. This suggests that many teachers are still working on a basis that ICT impacts pupil learning through look and feel, as opposed to any deeper impact on learning.

With regarding availability of ICT laboratories in the school, although the most of the teachers indicated that their schools had ICT laboratories but the majority (89%) mentioned they were not well-resourced in terms of infrastructure. The results further established that only 16% of the schools had computers for teachers' personal use but from them 69% had used because of 53% of them had not accessible in the schools. Although 25.7% of teachers have personal email accounts, from them only 65.8% have used in the school while 59.3% who used email did not access at school because of not easy accessibility. The interesting finding is 31.2 % of the teachers mentioned that the school had the internet facility but from them only 76% used the internet in the school because of them 71% mentioned accessibility to the internet is not easy at school. In terms of source of access to the internet, 57% of the teachers accessed from their modems, while 18 accessed from private internet cafes and 15% accessed from school's ICT laboratories. With regarding the internet search,62% of teachers reported that they had ever searched on the internet for a topic and received results and 41% mentioned that information retrieved from the internet was either relevant or very relevant to their topics.Despite the fact that they lacked internet facilities, the teachers relied on their modems when there was the need to search online. Also, it was found out that the teachers mostly used Google search engine for their online searches. Despite teachers' ability to search online for information, it was revealed that they had had no training in ICT use.

A general conclusion can be made that inadequate ICT facilities and the lack of training on how to use ICT to access information for school teachers could be affect adversely for school

education in the country. Therefore educators and policy makers in the field of education should consider this matter as seriously since it has been affected negatively for the education of the country as well.

8. Recommendations

Based on the findings of the study, following recommendations were made;

1. Provision of Information Communication Technology (ICT) Infrastructure for Schools

Since the findings revealed that the school in Sri Lanka lacked ICT infrastructure, the education authorities should strengthen existing ICT laboratories by providing them with adequate ICT infrastructure to enable teachers to utilize ICT for teaching purposes effectively. In addition to that teachers who are interested in acquiring personal computers and modems by the government through government subsidies, and loans with low interest rates the necessary measures should be taken to enable them to acquire ICT facilities.

2. Organizing Training for Teachers on Information Search

The study also revealed that teachers had not undergone any training in the use of ICT tools. Therefore it is being recommended that, the government should conduct training programmes on information search for teachers. This training should be continuous through seminars, workshops and in-service training programmes to enhance their skills in current trends in information retrieval. In addition, the government should grant study leave with pay to teachers who are willing to pursue programmes in information management since information is very vital to the work of teachers. It is further recommended that ICT should use as a subject and as an aid for teaching and learning in all teacher education programmes and all teachers training on ICT Education to be planned and coordinated by the Ministry of Education and the National Institute of Education which could be guaranteed to offer standardized ICT training programmes.

- 3.** Educational authorities should explore new strategies to enhance teachers' knowledge on ICT use for teaching purposes while understanding of the ways in which ICT should be implemented and to what extent it should be used in schools. The government should be ensured to provide more specialist advice and support for teachers in using ICT in teaching and learning.
- 4.** One of the most effective ways of embedding a culture within a profession is to deliver a programme of training and education on entry to the profession for teachers. Similarly, for the teachers in Sri Lanka should be tested on their ICT skills before being allowed to become a teacher.
- 5.** The government should perform an audit of ICT resources in schools to ensure that ICT facilities are available at a minimum standard at least across all schools in Sri Lanka. Thereafter, financial support should be targeted to those schools needing it most.

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