

## **Information & Communication Technology (ICT) Education in Universities and Its Relevance to Job Market: Perspectives from University and Industry Employers in Sri Lanka**

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### **Abstract**

Higher education in Sri Lanka has captured ICT in a large degree to create technologically sound graduates who can effectively face to the challenges in this rapidly changing job market demands with technology advancement. However, literature reveals that ICT adoption has not been taken place among university students to achieve the concern. These circumstances constitute why undergraduates do not use ICT up to the desired level. Therefore, this study aims to explore the present situation regarding ICT in universities and the job market, identifying necessity of ICT skills and the factors affecting to use ICT and strategies to promote using ICT in universities. The study followed the phenomenological approach using qualitative paradigm through semi structured interviews and focus group discussions. Altogether 24 semi structured interviews and focus group discussions were conducted at the four selected universities and various other fields. The data was analyzed using thematic content analytical techniques. Results revealed that the basic ICT is an essential component for today's job market and advanced ICT skills cause to have higher positions. Universities were making efforts to make graduates ICT literate by enhancing their facilities, resources and courses. To receive benefits using ICT, as lecturers believe that students should use ICT, ease related to ICT, availability of more infrastructure facilities, community to which students belong, prior ICT experience, gender, subject streams and the university belong were the main factors identified for using ICT. The strategies to promote using ICT in universities were to enhance the ICT environment of universities including infrastructure, staff and courses, to promote ICT based education, and to form strategic plans to force students to make full use of ICT in universities. It is recommended that the strategies brought up the interviewees could be implemented at university level to improve the ICT education.

**Keywords:** ICT, Undergraduates, Fresh Graduates, Lecturers, Employers.

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## **Introduction**

ICT has quickly become a crucial part of our global society and is dramatically transforming the world, facilitating innovation and productivity increases, connecting people and communities, and improving standards of living and opportunities across the globe (Dutta & Mia, 2011) enabling the compression of time and space. This circumstance has led to a paradigm shift in education capturing ICT at a higher level, since it is an important method to create a technology equipped generation to be well suited for the present job market demand (Aryasinha, 2002; Godamanna & Jayamaha, 2013).

Sri Lanka is also caught up ICT for its education with a long history. Sri Lankan higher education processes are becoming increasingly technology-intensive (Aturupane, 2008) with identifying the necessity to create graduates who are well equipped with ICT skills to make a good job market demand for them. Having identified the importance of ICT in this scenario, the Government of Sri Lanka under the National Policy on Information Technology (IT) has taken several initiatives to enhance access to ICT in the university education system. These intended to provide IT awareness to all undergraduates, establishing Wide Area Networks (WAN) in all conventional universities, providing the Internet access to all, and introducing ICT courses. These are being implemented in all universities of the country, at various levels. The Lanka Education and Research Network (LEARN) is the National Research and Education Network (NREN) of Sri Lanka, which interconnects Educational and Research institutions across the country. All the higher educational institutions including universities have now been linked to LEARN.

Further, the Sri Lankan government is also allocating extra funds yearly during the last decade to enhance the ICT infrastructure of universities (University Grant Commission (UGC) statistics, 2010) and gradually has increased the bandwidth of the LEARN appropriately. The government has also formed solid plans to enhance ICT in higher education so as to provide on-line access for all the university courses and distance education for all interested (Aturupane, 2008). The vision of higher education development in “Mahinda Chinthana Vision for the future” includes the establishment of Information Technology faculties in all universities and the university

students are expected to know how to work with a computer and to surf the Internet (Department of National Planning, 2010).

With those implementations Sri Lankan higher education institutions now rely mainly on computers and the Internet for all aspects of their activities: administration, teaching, learning and research. Also, conventional universities have made a high institutional investment in ICT infrastructure. Moreover, higher educational institutions increasingly rely on ICT to develop their students' skills because in all sectors of education, an immense growth on university students' use of computers and the Internet has occurred. The University students Competency Test for IT (UCTIT) exams under the Higher Education for Twenty first Century (HETC) project are also being conducted for university students in all 15 universities to provide an opportunity to enhance their IT skills and get recognition for their IT knowledge. Employers, moreover, expect graduates to be "ICT fluent" and to keep this trend continuously to have more jobs (Gunawardana, 2005; Wickramasinghe & Perera, 2010). Therefore, there is a strong emphasis in universities to constantly develop and evaluate their ICT provision in order to remain attractive to both graduates and employers. A varied set of stakeholders, not limited to the Government, is making attempts to ensure the relevance of education in terms of employer requirements, and more importantly today, the ability of students and graduates to compete globally taking ICT as a key competence for success.

However, the Central Bank, (2010) report highlighted even though the general skills are critically important for the labor market of a middle income country, but are especially scarce in Sri Lanka. Highest among these scarce general skills are English Language and ICT skills. The report further accentuated that a graduate who lacks fluency in an international language and ICT skills is cut-off from much of the world of the twenty-first century knowledge and information and that his or her productivity and performance at work would fall well below the level required by reputed private sector firms from their managerial staff and technical specialists.

Final result of these is the demand for graduates is not seemed to be favorable at all the time (Weligamage & Siengthai, 2003). Employers accused that the graduates do not possess the required ICT knowledge and

skills for job performance because employers seek quality graduates who can effectively face the challenges in the rapidly changing ICT environment. This is basically due to the existing mismatch between the graduates' ICT competencies and the employers' demand (Aggestam & Hallberg, 2004; Herath & Ranasinghe, 2011). These circumstances constitute why undergraduates are not using ICTs up to the desired level even under a regular improvement of ICT perspectives in universities. Therefore, it is relevant to explore this environment to substantially strengthen producing international quality graduates in terms of IT literacy and competence as a necessary condition for a good quality graduate in the modern world.

### **Research Problem**

The demand for Sri Lankan graduates is not seemed to be favorable at all the time since many employers are not satisfied with the competencies and skills of graduates. Highest among these are English Language and ICT skills. Employers seek quality graduates who can effectively face the challenges in the rapidly changing ICT environment and therefore the ICT is a success critical factor in undergraduate education. However, majority of the graduates in Humanities and Arts did not possess the ICT skills needed. Also, within this circumstance, the expected outcome of the ICT facilitated education in universities which is improving the Digital Literacy has not been achieved yet and it is evident that undergraduates possess only a general competency in IT proficiency. Then the problems arise why the graduates are lack of ICT skills, what are the reasons for lower competencies and how can be promoted ICT use in universities. Thus, it is essential to explore the current situation of ICT use and acceptance in Sri Lanka with the perspectives of lecturers, undergraduates and employers.

### **Purpose of the Study**

The main purpose of this study is to explore the present situation of ICT use and acceptance of graduates at the university context and at employer's end of the job market. The specific objectives of the study are:

1. To examine the current situation of ICT environment (facilities and courses) of Sri Lankan universities

2. To examine the importance and the requirement of ICT for fresh graduates
3. To examine the factors which mainly affect undergraduates to use ICT
4. To determine the strategies to promote ICT use of students

## **Literature Review**

### ***Use of ICT by undergraduates***

Many researchers have explored the use of ICT in universities in various aspects. Researchers argue that in 1997 the government implemented the *Tharuna Aruna Scheme* to assist unemployed university graduates in finding employment in the private sector (World Bank, 1999). The conclusions drawn from that scheme confirms that employers prefer Science and Commerce graduates who are well equipped with analytical and computer skills. The problem is that Sri Lankan students have very limited exposure to English and the development of technical skills has been neglected at even higher levels of education. On the other hand, nearly 80% of the applicants who were graduates in Humanities and Arts did not possess the skills needed (World Bank, 1999). The education system has been producing graduates without any exposure to computers (Wikramanayake, Hewagamage, Gamage, & Weerasinghe, 2007). When these graduates join the global job market, they are not equipped to use technology and they fail to compete with global ICT skill levels. Herath & Ranasinghe (2011) also have found that private sector employers complain that Sri Lankan Business graduates especially lack ICT skills. More recently, it has been shown that the expected outcome of the ICT facilitated education in universities which focuses on improving Digital Literacy has not been achieved yet (Godamanna & Jayamaha, 2013). This was further confirmed by Hewagamage (2013) with the results of the IT proficiency test conducted under HETC project for undergraduates in Sri Lanka, finding that only a 49.7% of undergraduates have obtained the pass mark (50). These circumstances create an uncertain dilemma why graduates are not ICT skilled. One motive may be the low quality of graduates who complete degree programs where the technology levels and skill intensity are lagging behind (Central Bank, 2009).

### ***Factors related to ICT use in universities***

Level of access, hours spent on computers and the Internet, frequency of use and perceptions on competence and generally the role of ICTs have been taken as the core determinants of most empirical studies. A significant difference has been identified between the ICT availability and the utilization by Umunadi (2011). ICT usage has been measured through the attitude towards computers, self-efficacy and computer phobia by Selwyn (1997), Macleod, Denise, & Haywood (2002), Waldman (2003), Gay et al. (2006), Li & Kirkup (2007), Mcilroy, Sadler & Boojawon (2007) and by Mahmood (2009) on a variety of ICT contexts. Most of the non-theory based studies have identified gender, age, and study year as the differentiating factors on ICT use behavior. Subject wise disparities in ICT acceptance have also been identified by Samaradiwakara (2013) and Mahmood (2009). They have found that the students from Arts and Humanities disciplines were not sufficiently aware of the benefits of ICT. Prior experience of computer or/and the Internet and the secondary school experience on computing were other differentiating factors identified (MacLeod et al., 2000; Li & Kirkup, 2007; Rekabdarkolaei & Amuei, 2008; Samaradiwakara, 2013; Luu & Freeman, 2011). A Sri Lankan study, found sector (urban/rural) differences in use and acceptance of ICT (Samaradiwakara, 2013).

Some researchers have empirically tested the knowledge on ICT, competences or skills on ICT through tests and identified the differences between perceived competence and the actual skills (Lee, 2003; Madigan, Goodfellow, & Stone, 2007; Hilberg & Meiselwitz, 2008; Nash, 2009; Hewagamage, 2009). These studies attempted to test whether the students possess the basic level of computer proficiency needed to study in universities in this era. Most of the studies indicate that often students' perceptions of ability decline due to their increased awareness of the skills needed in the workforce (Kaminski, Switzer, & Gloeckner, 2009). Lack of funds, infrastructure facilities, training, and language barriers have also been found as the reasons for the lower exposure on ICT.

### ***Strategies to promote using ICT in universities***

Strategies to promote ICT use among university students have been proposed in literature by various authors. Most of the authors have emphasized that educational strategies supported by technologies should be used to

incorporate dimensions of efficiency and quality in educational processes for a radical change in higher education to be suited for the technological advancement creating day to day.

Most of the time university graduates have few chances to develop and practice the necessary ICT knowledge and skills which required for the job market due to traditional teaching and learning process in the university system (Herath, 2009). While deepening the issue of promoting ICT interaction with higher education, many researchers have reached the conclusion that training processes on how to use ICT for learning and interactions must be re-evaluated in universities centered on a cybernetic approach to communication such as new learning communities, cyber courses based on renewed forms of the conception, organization, attainment and assessment of different forms of learning (Silva, Gomes, Oliveira & Blanco, 2003; Oye, Shallsuku & Iahad, 2012). In the UNESCO Educational Proposal on Technologies for Education (2009) has also proposed acceptance of a learner-centered educational approach that involves the use of multimedia resources for self-directed and flexible learning. They believe that teachers can variety of information technologies to improve efficiency and effectiveness of student learning. Further, Oye, Shallsuku & Iahad (2012) have emphasized the necessity of government ICT policies and guidelines to support university undergraduates in using ICT for their academic work. At the same time, in the report of ICT Strategy 2012-2018 of the University of St Andrews, Scotland highlighted that promoting a culture of student focus in all ICT structures and improving the ICT infrastructure to be more sophisticated for students.

However, Pires (2009) has pointed out that most importantly the students as beneficiaries should be motivated and should possess positive perception in order to grab the opportunity as they would be exhibiting them in future. He further found in his research that at the student level the ICT infrastructure is not used for the intended purpose but for some others like social loafing. Therefore it is needed to make well suited strategies to promote ICT in universities.

## **Methodology**

The study follows the phenomenological approach and it uses the qualitative paradigm since it aims to explore the current situation of ICT use and acceptance behavior of university students through semi structured interviews and focus group discussions.

Twenty four interviews (24) were conducted using non-probability sampling, often with a specific purpose in mind from the four selected universities and various other fields in Sri Lanka. Nine (9) lecturers who were in charge of ICT in the Faculties of Arts, Science/ Applied Science and Management and five (5) ICT instructors and one Librarian (1) were chosen from the University of Colombo, the University of Sri Jayewardenepura, the University of Ruhuna and the South Eastern University of Sri Lanka. Three (3) focus group discussions were conducted with students in three selected universities. Six (6) other interviews with top level employers who engage in recruitment of employees for jobs in leading fields in Sri Lanka such as diversified companies, higher education, industrial, administrative and finance were also scheduled.

Data collection for the exploratory study was carried out by personally visiting the relevant universities and other places in which the subjects were selected by the researcher. These interviews were conducted during December/2013-January/2014. Respondents from the job market were interviewed using early appointments through specific known contacts. Approximately, half an hour face to face interview was held with each interviewee. More than one hour was spent for each of the group discussion and students for the group discussion were selected at respective libraries of the selected universities, based on their motivation to participate. A group comprised of 10-12 students. A semi structured schedule was developed to guide the interviews and it indicates the themes covered by the interviews. The data collected was analyzed using thematic content analytical techniques.

## **Results and Discussion**

Background information of the subjects interviewed is presented in Table 1. According to the Table 1, the majority of the participants had considerable

working experience and experience with ICT. Moreover, most of them except the students were males and had at least a Bachelor’s Degree level education.

**Table 1: Subject Dynamics of the Exploratory Study**

Participants	N o.	Gender	Age	Highest qualification	Years of service/ study	Experience ICT (yrs)
University academics (ICT Coordinators) in Arts, Science, Management in selected universities	1	Male	40	PhD	11	13
	2	Male	42	Masters	14	20
	3	Male	37	Masters	10	14
	4	Male	52	PhD	28	25
	5	Male	53	PhD	23	18
	6	Female	32	Masters	6	7
	7	Male	42	PhD	10	10
	8	Female	52	PhD	20	15
	9	Female	28	Masters	4	14
Computer Instructors	1	Male	45	Masters	18	21
	2	Female	37	Masters	8	12
	3	Male	40	MPhil	13	17
	4	Male	26	Bachelor	2	3
	5	Male	48	Masters	20	20
University Librarian	1	Female	59	PhD	30	25
Undergraduate student groups (Focus group Discussions)	1	Male /Female	24-26		2-3	5-8
	2	Male /Female	23-25		1-2	3-5
	3	Female	24-26		2-3	5-10
HR Manager-Company	1	Male	38	Masters	12	14
HR Manager-Industrial	1	Male	40	Bachelor	10	14
HR Manager-Industrial	1	Female	38	Bachelor	10	13
HR Manager-Finance	1	Male	60	MPhil	40	15
	2	Male	50	MPhil	30	15
Director/ Recruitment	1	Male	43	Bachelor	12	10

### **Current situation of ICT environment in universities**

Interviewees from the university sector were asked about the current status of the facilities and compulsory and optional courses offered for the students and the students' performance with ICT. Simultaneously, the trend in ICT performance of fresh graduates was questioned from the respondents selected from the job market.

The perceptions of the ICT coordinating lecturers of universities revealed that introductory ICT courses had been conducted. While Word, Excel, Power Point, Internet searching and e-mail practices were covered through all the courses as the minimum requirement, some courses contained the advanced ICT options. The nature of these courses differed according to the Faculties and the universities. Some were credit based courses and others were non-credit based. Most of the faculty level courses were compulsory. There were yearly driven ICT courses in 2-3 Faculties. They have scheduled their course content from very basic to advanced. Other than this common situation, it was possible to find some specific programs conducted at department levels. A male young ICT coordinating lecturer (40 years old) with a PhD from the University of Sri Jayewardenepura endorsed that:

“We have implemented a program called computer practices (using key board to practice typing) for first year students at our Department level to enhance the ICT skills of poor skilled students. Since it is an optional, students gradually give up attending as they are tight with the content of their normal degree course. We have further introduced subject specific software which I used for my higher degrees in abroad and students are mandated to use them in order to make them smart with ICT use at their places of employment. For example, research students should use LATEX software to arrange their thesis and we provide the basic introduction for the software.”

The Librarian interviewed also reiterated that other than preliminary courses, introductory courses and preliminary laboratory courses conducted as compulsory courses, they further facilitate digital literacy courses to train the students to work under digital environments.

A different aspect of implementation has been carried out in a particular faculty in a selected university. A 37 year aged male ICT coordinating lecturer with Masters level qualification stated that:

“Other than the fundamental ICT courses, almost all the subjects in the faculty are connected with ICT. For example Accounting as Computer based accounting, Marketing as Digital marketing, ERP-Enterprise Resource Planning etc. Then all the students have to use them, whether they like or not to be skilled with ICT.”

Moreover, the majority of the ICT coordinating lecturers concurred that they always plan to initiate new ICT related course units for students and that some of them have already implemented such programs.

All the ICT instructors in selected universities also agreed with what the coordinators mentioned. Moreover, they stated that other than common introductory ICT courses, students are facilitated with practical classes on subject specific ICT.

The responding lecturers and the ICT instructors were questioned about the infrastructure facilities available in their faculties and universities. Regular developments on ICT environment in universities have taken place. Some of the faculties own Wi-Fi zones and other remaining faculties have also planned for Wi-Fi. According to their perceptions, students are facilitated with ample computer and Internet labs where they can work whenever they need. Majority of the faculties have access for a variety of ICT tools and the ICT instructors agreed that timely planned repairing of computers and connections take place.

Students' agreement with their lecturers' and instructors' perceptions were examined at group discussions. All the groups agreed with their lecturers regarding the compulsory and optional courses. However, the group of students who participated for the group discussion at the University of Ruhuna endorsed that:

“Although we are facilitated with the basic ICT courses and other subject related ICT courses, not all the students can equally catch up with them. One reason is the support given during the computer work is not satisfactory and therefore some of our friends give up the

courses. In order that students expect to have more ICT courses very basically with a strong assistance and more facilities because with limited facilities we face problems specially in using communication technologies.”

Not only the group of students from University of Ruhuna, but students from other selected universities except South-Eastern University of Sri Lanka (SEUSL) also reiterated that they have not been allowed to use communicating ICT tools. The students of the SEUSL mentioned that they have Wi-Fi zones and therefore they can use their own mobile computing devices to trial a variety of ICT tools. However, the students who joined the discussion at the University of Sri Jayewardenepura cited that their lecturers always encourage them to get ICT skills.

The quality of ICT capabilities of fresh graduates was probed into at the employers' end. Employers agreed that there has been an improvement of the percentage of ICT capable graduates within last 5 years. Some of the job market employers stated that fresh graduates are smart in using ICT, which means that the universities have identified the necessity and are performing their job well. However, private sector employers claimed that the fresh graduates' capabilities are not exactly matched with their requirements and one employer with 12 years working experience endorsed that:

“If graduates have gained ICT skills from their respective universities, then they are able to catch up with the rapidly changing ICT environments in working places. Therefore, we prefer ICT skilled graduates. Since there are many graduates who are willing to get jobs, we always try recruiting well-skilled ones for our limited requirements.”

Considering all the views pointed by university people, it could be highlighted that universities were making maximum efforts to build ICT literate graduates to be able to create a global demand for their products. They have turned to the enhancement of ICT facilities with more ICT oriented courses at faculty levels and students are also immersed in this ICT environment in their faculties at respective universities. Concurrently, employers are also striving to recruit mostly skilled graduates to be compatible with ICTs in this electronic era.

### **Importance and the requirement of ICT for graduates**

All four categories of participants from the university field (ICT coordinating lecturers, ICT instructors in computer labs, librarian, undergraduate students) and from the job market unanimously emphasized the importance of ICT for fresh graduates as a requirement.

Most of the ICT coordinating lecturers and ICT instructors stressed that since each and every industry is information based in this information age and therefore work processes in all industries are based on ICT, fresh graduates should be equipped with not only with computer skills but also ICT skills.

One male ICT coordinating lecturer with 10 years working experience in the University of Sri Jayawardenepura described the importance of ICT as follows:

“ICT is essential without being based on whatever the field is. As an example, we have a student who is an artist. Now, he is a performing artist using computers very well. Moreover, Archaeology students do marvelous visualizations using Google sketch-ups. It is clear that each and every task can be performed using ICT. So, will there be job opportunities without ICT?”

They further claimed that basic ICT is an essential component for fresh graduates and advanced ICT is an advantage in getting jobs. A young (38 years-old) Human Resource Manager with 12 years of his working experience in a reputed diversified company in Sri Lanka stated:

“Fresh graduates should have at least basic skills in using computers and especially Internet searching abilities. So, we conduct a test on Word, Excel, PowerPoint and Internet searching skills to measure their basic ICT capabilities.”

An ICT coordinating male lecturer with a PhD and 23 years working experience in the University of Colombo explained the importance of having ICT skills for graduates in another aspect. He said that:

“Our graduates have to compete with students from International schools where they teach programming languages as PASCAL in grades 6-7. Therefore, our students have to go down even at the local job market without having ICT on their hands.”

This statement was confirmed by one Human Resources Manager who was 38 years of age and holding a Masters level qualification in a reputed company in Sri Lanka stating:

“We mostly prefer to enroll school leavers from International schools since they are more elegant in handling various novel ICT than graduates from traditional universities.”

A young ICT coordinating female lecturer from the University of Ruhuna emphasized that past students of her faculty have been blessed with better jobs based on the certificate given for the compulsory ICT courses conducted in the faculty. She further showed examples of the graduates who were well skilled in ICT being promoted in the private sector jobs as well as in the government sector. This was further confirmed by an ICT coordinating lecturer who has qualified with a PhD stated that:

“Our department has faced a big problem in recruiting temporary instructors with ICT skills because the top ten in the list have already got better jobs. Today I called for the 37<sup>th</sup> student in the list to work as a Temporary Instructor for the Department.”

All the participants from the job market reiterated the same opinion. They highlighted that, higher ICT skills is an advantage for securing better jobs in Sri Lanka. They further stressed that after having their basic training they group new comers according to their skills, and if someone has got equipped with advanced ICT skills he/she would be able to get better positions. Most commonly, computer instructors in all selected universities agreed on that opinion.

However, the students who participated in group interviews voiced their opinions freely disagreeing with what the earlier interviewees had stated. Most of them claimed that they had followed computer courses before entering the university since they had identified the necessity for ICT to successfully cope up with this digital era. Some of them believed that it is unable to successfully complete the degree at universities without having ICT experiences and that therefore they had followed ICT courses. Some believed that ICT is a trend and they have to move towards it. A group of students in the Arts stream have started to follow ICT courses outside the university simultaneously while following their degrees at universities to get

better opportunities in the job market. This was confirmed by the focus group discussion held at the University of Colombo. They agreed that:

“ICT is essential. It is very important for some job fields. We think all students have identified the necessity in our batch and they follow courses at various institutions. Some senior students have laptops. We have lab facilities, we use them optionally. Some subjects are ICT facilitated. But the problem is we have no added time to use ICT with our course work.”

The perceptions of the Librarian with her 30 years’ experience in the university sector and the Human Resource Manager from the Garment industry are also given herewith. The Librarian emphasized that:

“New students are knowledgeable on ICT and this trend has grown during the last 5 years. Knowledge has been confined mostly to e-mail, Facebook, Internet searching and music, You Tube etc. These skills also may be useful for the job market in this networked era.”

The HR Manger endorsed that:

“We check for the qualifications in ICT of coming graduates. Most of them can manage basic ICT such as Word, Excel. That capability is enough for us for the preliminary stages.”

However, the students from the Faculty of Arts, University of Ruhuna expressed their ideas in a different way. All of them agreed that:

“Even though ICT is a necessity, it seems that not all have equally identified its importance. Most of the students who identified the importance have followed computer courses before and after entering the university. On the other hand, if there is a compulsory ICT course in the university, some students only prepare for the tests of that course and thereafter ignore using ICT continuously.”

According to all these perceptions of the interviewees, it is apparent that basic ICT is considered as an essential component for today’s job market and advanced ICT skills compose a plus point for better positions. It was found that Word, Excel, Power Point, e-mail and Internet searching and its applications are the essential basic ICT tools for fresh graduates. Moreover, it was revealed that even though, most of the students have identified this

necessity; still there are some who do not accept ICT as an essential element. On the other hand, job market employers seek ICT equipped employees. They further put their emphasis on the job market demand with ICT and believe that a graduate can easily capture the demand by him/herself for their position with advanced ICT skills. Therefore, it is clear that the current study is feasible and relevant.

### **Factors which mainly affect undergraduates to use ICT**

Not all students/graduates behave in the same manner when using ICT and they may have different factors to use and differences in using ICT. This aspect was inquired from the university community and the job market employers.

Different perceptions were given by the interviewees from the university field regarding the factors affecting on using ICT. Most of the ICT coordinating lecturers affirmed that the students are less motivated and they do not seem to have understood the benefits that could be gained through ICT. They further argued that the students are always credit, certificate and marks oriented and willing to have better positions by only obtaining the certificate for ICT courses. Therefore, they reiterated that the students wish to get certificates with less effort and therefore lecturers have to always force students to use ICT showing its benefits. The same view was also confirmed by most of ICT instructors in selected universities.

A 48-year old male computer instructor who had 20 years' experience and qualified with a Masters' Degree endorsed that:

“It seems that students are not much enthusiastic on ICT and this may be considered as a privilege by Arts students. Poor attendance is higher for male students than female students in the Arts stream. But, I don't know whether they practice using their own methods or devices.”

A forty two year-old lecturer with 10 years working experience and holding a PhD Degree who was interviewed from the Faculty of Management in the University of Colombo further elaborated the views of others:

“Students are smart now. But, most of them have not really identified the necessity of ICT for the job market. Though they behave blindly

regarding ICT during the first two years in the university, they need ICT skills to continue their studies in their third year. That is a technique we use to direct them towards using ICT”.

A different perception was presented by three ICT coordinating lecturers from Sri Jayewardenepura and South-Eastern universities. One mentioned that though the present students are more knowledgeable than earlier students, they are less motivated for learning new applications other than traditional and highly required ICT applications. Another lecturer affirmed that present students prefer IT practical than theoretical classes having understood the relative advantages that could be drawn from ICT than manual processes. The other lecturer who brought forward a totally different perception was a 28-year old female with 4 years’ experience in the university with a Masters’ Degree who stated that:

“I think that all the students have identified the requirement in our faculty. We conduct ICT classes on weekends. Students enthusiastically participate in them too. I personally experienced that they always question to clarify their doubts about the lesson and other new applications.”

Then the students were questioned about their views regarding ICT use. All groups of the students in selected universities agreed that they have really understood the chances that they can get at the job market with ICT certificates and skills as their senior students had got those chances. Also, they further stated that the lecturers always believe that they should use ICT and encouraging them at all times. They were satisfied with computer and Internet facilities too. But they face problem shaving extra time for using ICT since their course activities of degree programs becomes tight. Then they only limited to subject applications of ICT and therefore they suggested changing curricula towards ICT oriented programs.

Majority of the students further claimed that they have clearly experienced the efficiency and effectiveness that could be gained by using ICT than their manual practices. It seems that they have become inclined to their traditional systems with rigid time frames. However, some students raised the issues of receiving minor support at computer labs, limited facilities and use of limited applications as problems in using ICT at universities.

Most of the interviewees identified the existence of the digital divide among students/ graduates. Most of the university people have identified that this gap declines throughout the time in the university and that it vanishes when they leave the university. Students also entirely agreed with this perception and further clarified that:

“Most of our colleagues from rural areas make efforts to remove the gap and mostly achieve this when almost one year has elapsed. But, some of our friends they absolutely give up using ICT.”

However, one ICT coordinator, a female lecturer from the SEUSL endorsed that:

“There is a big variation among students in their ICT performance. One of them is the difference between the students from metropolitan areas and rural areas. This gap continuously exists.”

She was 28-year old lecturer with a Masters Degree having only 4 years’ experience in the university service. Sometimes, her lower experience in university service may have caused to her to give a different perception than other senior people. However, that view could not be totally discarded due to a perception made by one Human Resource Manager, who was a 38-year old male with 12 years’ experience in employment who said that:

“We normally prefer to recruit persons who have done their education in metropolitan areas because they are always stylish in English and are keeping up with ICT.”

It seems that the digital divide may continue for a little time after the graduation too.

Moreover, the university community has identified that the students who had ICT experience at their schools or through extra courses they followed before entering the university have performed well in using ICT. This was confirmed by the focus group discussion held at the University of Ruhuna. All the students agreed that:

“Some of our students show best performance using ICT since they have prior knowledge and experience with ICT. We believe that prior experience is essential to successfully complete the computer courses in the university.”

Further, the university community claimed that the students who are facilitated with their own computers and Internet connections are more skillful than others. One of the ICT coordinating lecturers with more than 10 years' experience in the university from the Arts Faculty of the University of Sri Jayewardenepura reiterated that:

“There is a big variation among students in ICT performance. Students, who were familiar with ICT in their schools or in private courses, perform well. On the other hand, most of the students do not know even how to use a keyboard at the beginning, but finally they do programming too.”

Some of the lecturers and ICT instructors stated that they have experienced a gender difference in using ICT. They affirmed that male students are more skillful than females. Moreover, some of the employers revealed that most of the time fresh graduates differ in ICT performance according to the subject stream followed at universities and according to the university they graduated from.

Fresh graduates' flexibility towards their job environments were inquired from the employers and all the employers in the private sector claimed that fresh graduates selected are interested in working in ICT oriented milieus. Moreover, they affirmed that it is not needed to train selected graduates for their specific ICT environments, because the graduates' are confident in their ICT skills. However, they mentioned that this may be because they select the spirit from the graduates' pool.

Suggestions proposed by the interviewees disclose the existence of more factors which affect the ICT use in universities. According to the perceptions of ICT coordinating lecturers, ICT instructors and students, it was clear that most of the time students are compelled to use ICT since they receive benefits using ICT and since their teachers think that they should use ICT for their future. Further, according to the views of a majority of students, ease of using ICT and the availability of more infrastructure facilities were other factors identified. Community to which students belong, their ICT experience, gender, subject streams and the university they belong were other factors identified in using ICT.

private sector employers claimed that they prefer if fresh graduates would be able to use communication technologies such as Skype, Facebook and e-mail. Finally, a novel view emerged through the perceptions of employers. They believe that the students can build up a self-demand at the job market by improving their individual use of ICT during the undergraduate period.

### **Conclusions and Recommendations**

This study covered the present situation regarding ICT in universities and the perceptions of the job market employers, identifying the factors to use ICT and strategies to promote using ICT in universities. Semi structured interviews and focus group discussions were conducted at the four selected universities and various other fields in Sri Lanka.

Perceptions of the interviewees revealed that the basic ICT is an essential component for today's job market and that employers believe that a graduate can easily capture the demand by him/herself for their position with advanced ICT skills. Universities were making efforts to make graduates ICT literate and a majority of the students have identified the necessity of ICT for the job market demand. Factors mainly affect to use ICT were to receive benefits using ICT, since their teachers think that they should use ICT for their future, ease of using ICT, availability of more infrastructure facilities, community to which undergraduates/graduates belong, ICT experience, gender, subject streams and the university belong. Also the students'/ graduates' attitudes and the self-efficacy towards the work/job and ICT were also affecting in using ICT. The identified strategies to promote using ICT in universities were to enhance the ICT infrastructure facilities, to commence more ICT courses, to make arrangements to upgrade the ICT related staff in universities, to replace the traditional university activities by electronic, to form strategic plans to force students to make full use of ICT and to promote ICT based education at universities. Since it was revealed that the complete utilization of ICT has not taken place at universities by the students and that therefore it is recommended to take actions on the strategies suggested by the interviewees of the study.

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