

The Social Cost of the Integration of Information and Communication Technologies, Information, Education and Communication, on the Young of the Republic of Mauritius

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Abstract

The applications of the Information, Education and Communication approaches to all sectors have brought unexpected changes in the attitudes and behaviours of people of all ages. The overwhelming amount of theoretical and empirical work done regarding the impact of ICT on educational processes has highlighted the benefits of ICT to students, teachers, and parents. Mauritius is faced with a double dilemma: the positive value of information technologies, on the one hand, and the potentialities and possibilities of the negative impact on the life of people on the other. This paper aims to gauge the impact of the ICT, IEC and IT on the Mauritian population confronted with the issues related to the access to information through the technological advances the world has been exposed to. It is also to draw the attention of policy-makers of the need to consider the “digital opportunity” and its influence on the Mauritian population.

Keywords: Social cost, Information, Education and Communication, Information and Communication Technologies, social change, digital opportunity index

Introduction

The growing interest in the impact of ICT on the life of the population of countries all over the world has prompted us to analyze what researchers in other countries have found out on the subject. A survey of works carried out in several countries has revealed that things are not that bright and beautiful as one would expect. The ICT Impact Report (2006) states that “the use of ICT in education and training has been a priority in most European countries during the last decade, but the progress has been uneven. There are considerable differences of “e-maturity” within and between countries, and between schools within countries”. In a working paper, Eva Tot (2002) highlights the following system-level problems in school ICT development: maintenance costs of

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ICT equipment; special skills and qualifications required for managing the ICT system; training for use of ICT is not an integral part of teacher training; lack of career and monetary incentives. Further it was underlined that “the use of the web as an information channel based on electronic forums and mailing lists is considered promising – but the number of users remains rather limited”. The UNESCO ICT and Education Indicators

Scoping Exercise (2006), “study which will contribute to the work of the International Partnership on Measuring ICT’s for Development , expected to be ready after 2007, should yield interesting results and shed lights on the impact of ICT in Education as a whole. In a research report (2004 p. 4), “the findings suggested that ICT was helping to draw pupils into more positive modes of motivation. ICT appeared to be offering a means for a range of pupils to envisage success”.....” a wide range of motivational impacts of ICT upon pupils were reported...”. “All secondary teachers interviewed indicated that they felt that ICT had positive impact upon pupils’ interest in and attitudes towards school work”. Further, it was pointed out that “there was evidence of some pupils going unto unsuitable web-sites deliberately... ‘although they were aware that pupils were finding alternative ways to communicate by using ICT and offered just as many positive outcomes as potential negative outcomes....”. It was also reported that “ICT can have positive impact on in-school antisocial behaviours; however some negative behaviours such as the sending of abusive emails was also mentioned...” In an article published in Electronic Magazine of Multicultural Education, C. Molins Pueyo (2006) highlights some important elements on the use and misuse of ICT in the school environment in Spain. The author pointed out that “the use of some ICT elements by students is perceived negatively by schools. The school does not recognize the value of applying them either to curriculum or social learning.

The author stated that “the cellular phone is the lowest valued device among teachers...” In an open reflection part, the author observed that “Although some experiences of incorporating new technologies in the classrooms have resulted in positive learning, there is still a lot to explore about potentialities in other dimensions”. Further, it was argued that “the most worrisome fact is that the value of ICT uses for self-learning and as a means for cultural production is not recognized as central to students who are social and educational agents”.

As can be judged by the above, both positive and negative impacts of ICT have been observed by researchers. These need to be acknowledged and dealt with as fast as possible so that the effects can either be minimized or eliminated for the benefit of the people exposed to the shortcoming in the use and abuse of ICT the world over.

Background

The incorporation of ICT into educational institutions has drastically affected their functioning; be it at pre-school, primary, secondary and tertiary levels. The structures of learning spaces has undergone in-depth modifications; teaching and learning are being envisaged under new conditions; innovative teaching methods using new technologies are being researched and implemented; the traditional roles of teachers are being challenged and new pathways to students’ learning is being explored; from passive recipients of knowledge, they are encouraged to become active learners. Moreover, institutions like the family, schools and others have become integrated, creating a wider but global society. The Mauritian society has not been spared by the waves of changes swiftly sweeping across countries over the globe. Nowadays, technology occupies a major role in the lives of populations, and our children, adolescents, youths, adults and elderly alike are all under the spell of the phenomenon. The impact of the negative influence of ICT on adolescents and youths has been the concern of one and all in the light of the antisocial behavior among some members of the younger generations. The IT language is enriched everyday, and many new terms introduced. This is either to warn users against the misuse of ICT or against the overwhelmingly high number of potential dangers that can hamper the good functioning of the hardware.

The Country

Mauritius is an island of 2,040 square kilometers in the Indian Ocean situated 20 degrees south of the equator, and lies on longitude 57.5 east. It is found at 2,036 km off the south east coast of Af-

rica. The population is over 1, 2 m. with more female than male; it has a literacy rate of around 90%. The island is always on line through all modern communication devices: radio, television, satellite networks, internet services and the GSM network keeps the population and the visitors connected to the world all year round. The island never had an indigenous population, and has known its occupants through the first Arab, Dutch, Portuguese, and French sailors during the 16th and 17th centuries. As a Dutch colony from 1598 till 1710, it was claimed by the French in 1715, and was named Isle de France. The British, who coveted the island, captured it during a surprise attack in 1810. From then till today, the island is known as Mauritius. The country gained its independence from Britain on 12th March 1968, and became a Republic on 12th March 1972. The melting pot which constitutes the population is made up of the descendants of the liberated slaves, Indentured labourers from India and their descendants, Chinese and Muslim traders, The French Colons and their descendants and others. The official language is English, but French and Creole are most commonly used languages.

ICT in the Mauritian Context

In Mauritius, the ICT sector has been defined by the Mauritian Central Statistics Office following an adaptation of the OECD (Organization for Economic Cooperation and Development definition as: “ A sector comprising ICT-related activities of Manufacturing, Telecommunications, Wholesale and retail trade, and Business services as call centers, software development and website development”. The ICT sector is a booming sector in all aspects: contribution to the GDP; imports and exports; employment; telephones; mobile cellular phones; internet; and other related areas. In 2006, telecommunication activities represented 65.6% of the total value added to the sector. The latest figures show that the value added generated by the ICT sector in 2006m was more than double the amount generated in the year 2000. The real growth rate of the sector was 11.2%, and the contribution to GDP was 5.8% as compared to 4.3% in the year 2000. In the import and export sector, the data available indicates that the imports of ICT goods increased by 300%, but shows a decline of 23.1%. Exports of ICT goods increased by more than 15 times, showing an increase of 36.4% compared to the 2000 figures. The number of employment in the establishments operating in the ICT sector showed an important increase reaching 87.6%, with over 8,000 representing 2.8% of total employment in the country.

ICT Infrastructure at End of Year 2000 – 2006

Data published in 2007 from: Information and Communication Technologies Authority (ICTA) and National Computer Board (NCB)

As far as telephone is concerned, the number of fixed telephone lines was 357, 300, as compared to 262, 000 in 2000, representing an increase of 36.4%. The number of fixed phone lines per 100 inhabitants, (Teledensity) increased from 22 to 28.4 through 2003 till 2006.

Availability of ICT in Households for 2006

Comparatively, the number of mobile cellular subscribers registered an increase of more than 300% reaching 772,400 in 2006 compared to 174,500 in 2000, so that by 2002 it outnumbered the number of fixed telephone lines (Figure 1). Mobidensity or the number of mobile cellular phones per 100 inhabitants also increased by more than 300% reaching 61.5 in 2006 compared to only 14.6 in 2000.

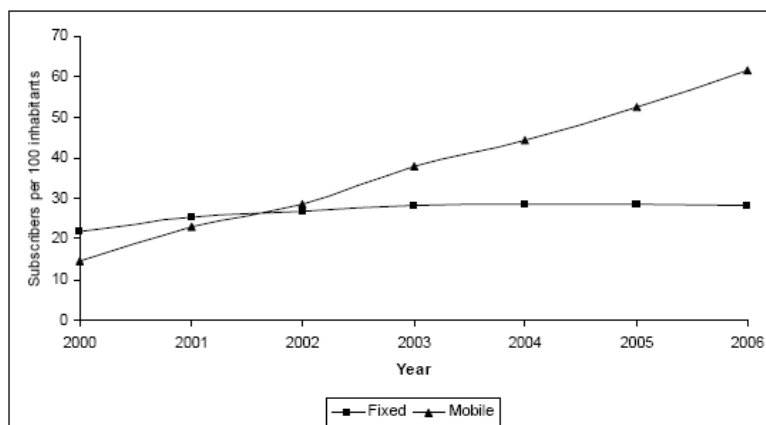


Figure 1: Subscriber's of mobile cellular phones and fixed telephone lines

Internet Subscribers

The number of internet subscribers at the end of 2006 reached 137,500, representing an increase of around 300% over the figure of 35,000 in 2000. The number of internet subscribers per 100 inhabitants worked out to 10.9% in 2006 compared to only 2.9% in 2000.

It is noted that the number of internet subscribers registered a jump of 64.9% to reach 128,600 in 2005 from 78,000 in 2004 following the introduction of mobile internet services towards the end of 2004. In 2006, the number of mobile internet subscribers increased to 61,100 from 43,100 in 2005 while the number of subscribers to fixed internet services declined to 76,400 from 85,500.

As a percentage of total internet subscribers, mobile internet subscribers increased to 44.4% in 2006 from 33.5% in 2005 while fixed internet subscribers declined to 55.6% in 2006 from 66.5% in 2005.

Type of Internet Access

Broadband internet, defined as internet connectivity at speed of at least 128 kilobits per second, was introduced in 2002. Broadband internet subscribers, which were 1,200 in 2003, increased sharply to reach 81,069 in 2006. Conversely, narrowband internet subscribers (those with an Internet connection of less than 128 kilobits per second) declined from 60,052 to 56,410 during the same period

In 2006, the proportion of subscribers with broadband connection was 59.0% against 2.0% in 2003, while that with narrowband connection was 41.0% in 2006 as opposed to 98.0% in 2000.

In 2006, 19,948 or 24.6% of the broadband internet subscribers had access to the service through a fixed line (including wireless), of which 10,582 through a Digital Subscriber Line (DSL) connection.

Some 61,121 or 75.4% had access through a mobile cellular telephone. Among the latter group, 44,471 were using General Packet Radio Service (GPRS) and 16,650 the third Generation of Mobile telephony (3G).

Digital Opportunity Index (DOI)

The DOI is a composite index that measures “digital opportunity” or the possibility for citizens of a country to benefit from access to information that is universal, equitable and affordable. The index is based on a set of eleven indicators grouped in three sub-indices; it is measured on a scale of 0 to 1, where a value of one indicates highest digital opportunity and a value of zero indicates least digital opportunity. (See Table 1 and Figure 2.)

Broadband internet as defined by the Information and Communication Technology Authority (ICTA) is “connectivity at a speed equal to or greater than 128 kbps, as the sum of capacity in both directions”. However, for comparability purposes, the DOI has been computed based on broadband internet connection of speed equal to or greater than 256 kbps.

The DOI for Mauritius improved to 0.50 in 2006 from 0.45 in 2003. Improvements are noted in all the three sub-indices constituting the DOI. However, while the sub-index for “Opportunity” is high (0.97), those for “Infrastructure” (0.38) and “Utilization” (0.16) are low.

Table 1. Digital Opportunity Index

Category	Index			
	2003	2004	2005	2006
Opportunity	0.95	0.96	0.97	0.97
Infrastructure	0.33	0.34	0.38	0.38
Utilization	0.06	0.06	0.08	0.16
Digital Opportunity Index	0.45	0.46	0.48	0.50

Source: International Telecommunication Union (ITU)

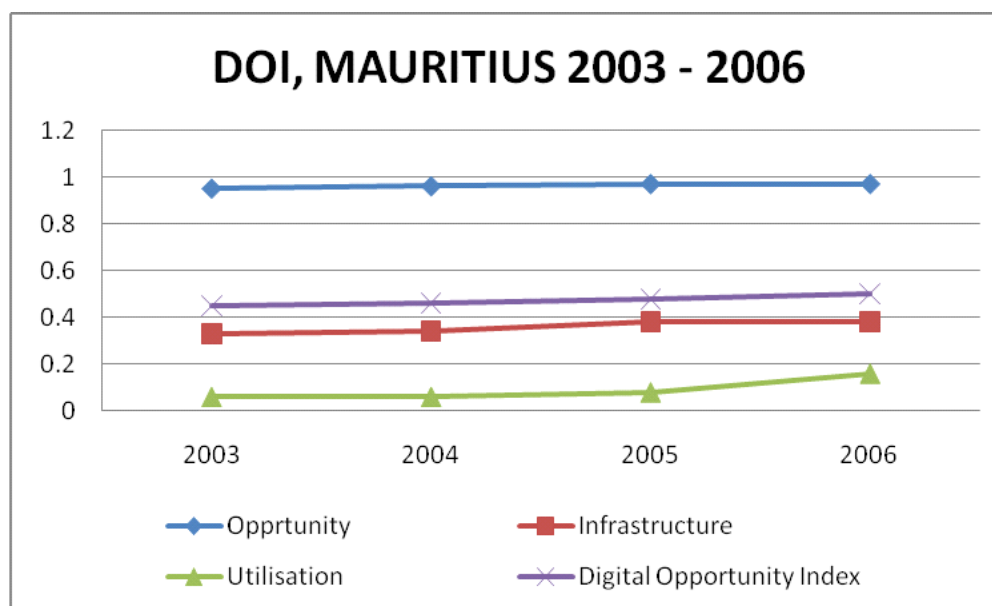


Figure 2: Digital Opportunity Index

According to DOI figures compiled by the International Telecommunication Union (ITU) in 2005, for 180 countries, Mauritius ranked 50th with a DOI of 0.48 while Republic of Korea with the highest DOI of 0.79 ranked first. This is given in Table 2.

Table 2. Position of Mauritius
Source: International Telecommunication Union (ITU)

Category	Index				Rank
	Opportunity	Infrastructure	Utilization	DOI	
Korea Republic of	0.99	0.74	0.64	0.79	1
Sweden	0.99	0.74	0.35	0.69	6
United Kingdom	0.99	0.68	0.33	0.67	7
Australia	0.98	0.63	0.35	0.65	12
Singapore	1.00	0.68	0.27	0.64	16
Mauritius	0.97	0.38	0.08	0.48	50
Seychelles	0.97	0.32	0.10	0.46	54
South Africa	0.90	0.18	0.05	0.38	91
India	0.80	0.04	0.04	0.29	119

ICT Usage in Education

Primary Schools

At the end of March 2006, the percentage of primary schools providing Internet access to students for study purposes was 4.8% compared to 4.5% a year earlier. The number of students per computer improved to 163.4 from 185.0 in 2005.

Secondary Schools

At the end of March 2006, the percentage of secondary schools providing Internet access to students increased to 92.1% from 72.3% in 2005. The number of students per computer worked out to 23.9 in 2006, compared to 24.8 in 2005.

The number of students examined in ICT at School Certificate (SC) level increased from 4,018 in 2005 to 4,177 in 2006. However, as a percentage of the total number of students examined at SC level, it decreased to 25.4% in 2006 from 25.9% in 2005. The number of students examined in ICT at Higher School Certificate (HSC) level in 2006 was 822 representing 10.2% of all students examined at HSC level compared to 658 or 9.0% in 2005.

Tertiary Education Level

The number of students enrolled in ICT or an ICT-dominated field at tertiary level was 3,971 in 2006/2007 compared to 4,134 in 2005/2006. As a percentage of students enrolled at tertiary level, this represents a decline to 12.0% in 2006/2007 from 14.3% in 2005/2006.

ICT Access by Households

In 2006, 77.4% of households had fixed telephone and 68.7% mobile cellular telephone. The percentage of households with television was 95.7%. Some 8.3% of households had more than one television set and 11.1% had paid TV channels (other than MBC). Households owning a computer represented 24.2% of all households while those having internet access at home were 16.6%.

Nearly 60.0% of households with no computer at home reported that a computer was not necessary, while a further 34.9% gave its high cost as the reason for not having one. Some 72.0% of the households with no computer did not have the intention to buy one; 5.0% intended to buy one in the next twelve months and 23.0% to buy one after a year.

Among households with computer, 68.4% had access to Internet. The most common mode of access to Internet was dial up (76.0%) followed by ADSL (16.8%). Among households not having Internet connection some 43.4% reported that they do not intend to obtain Internet connection; 27.0% intend to have access within the next twelve months and 29.6% after one year.

ICT Access and Use by Individuals

In 2006, some 62.9% of persons aged 12 years and above did not have any knowledge on IT.

Another 30.8% were IT literate, but did not have any IT qualification. Around 2.2% had the Ordinary level Certificate in computer studies and a further 0.4% the Advanced level Certificate. Some 1.1% had a diploma or degree in IT, and 2.8% had some other certificate in IT.

In 2006, 31.0% of persons aged 12 years and above reported using a computer. Some 45.9% of them reported using a computer at least once a day while another 43.6% used it at least once a week but not every day, and 10.5% less than once a week. The place of use was: at home (63.5%), school/educational institution (33.8%), work place (33.5%), and other (11.8%). Among persons using a computer at home, around 52.3% reported using the computer for entertainment purposes, 45.9% for playing games, and 19.6% for doing office work. It is to be noted that some persons may use a computer at more than one place and for more than one purpose.

Internet Use by Individuals

In 2006, the percentage of persons aged 12 years and above who used the Internet from any place was 18.0%. Among Internet users some 34.5% used it at least once a day, 46.8% used at least once a week but not everyday and 18.7% used less than once a week. The reported places of access to Internet were: at home (69.8%), schools/educational institutions (21.0%), workplace (28.9%), cybercafé (8.4%) and other (4.4%). Among persons using the Internet at home in 2006, 62.2% used the internet for email/chat, 76.2% for news or information, 27.3% for downloading games/music/software, 9.1% for distance learning and 7.7% for internet phone. It is to be noted that some persons may have used the Internet at more than one place, and for more than one purpose.

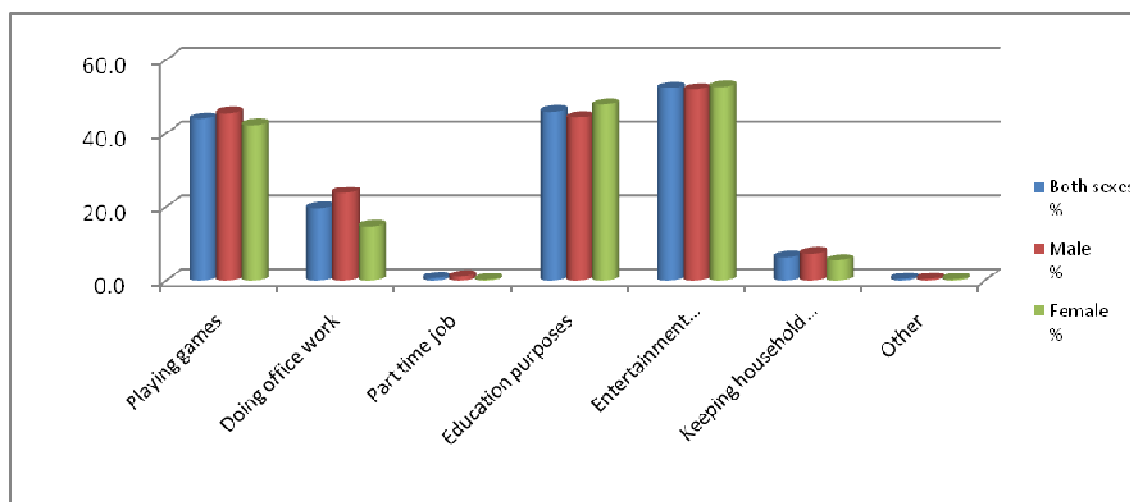


Figure 3: Purpose of Computer Use at Home

Purpose of Computer Use at Home other than Internet

The purpose of computer use at home identifies both males and females as taking interest in computers as a means of entertainment; while a higher percentage of female make use of the computer for education purposes. With the computer having more of a leisure and entertainment function; no doubt children and adolescents, taking adults as models make the same use of the equipment as their parents. (See Figure 3)

Methodology

In order to get a picture of the extent of integration of ICT in the life of the members of our younger generation, eighty teachers working in secondary schools were asked to interview their students on three topics: Use of mobile phones; Access to internet; and on IT facilities at school. They were interviewed by teachers working in the school, but not necessarily their class teachers; Most of the time it was a face-to-face interview that lasted less than five minutes. The interviewers were thus, able to contact an appreciable number of students during free periods, short breaks between classes, or during lunch breaks. The data was recorded daily and kept in diaries; these were then communicated as soon as the opportunity arose. The results of the survey were lengthily discussed with the teacher-interviewers and every aspect related to the topic was thoroughly analyzed and explained so as to avoid any biases and value judgments.

Cases were considered irrespective of any subjective elements such as socio-economic status, region, ethnic group, religion, culture or any such variables which would negatively influence the opinion of the interviewers. The aims of the exercise were clearly explained well before the survey was carried out. Each interviewer knew exactly what information they had to seek and how to get the consent of the interviewees, reassuring them of the strictly confidential and anonymous nature of the outcome of the exercise. One of the reasons for not choosing class teachers for the exercise was to get the trust of the interviewees and to assure them of the seriousness of the outcome and possible impact if nothing is undertaken to prevent a deterioration of the prevailing situation. The interviewees were all aware of the consequences to one of their colleagues who were caught in an embarrassing situation when one of them made a film on a compromising event some students got involved in. The event known as “the show” was given vast publicity in the press. The undesirable consequences of such practices are still on the mind of parents, teachers and the students themselves. Hence, the willingness of many of the interviewees to participate in the exercise was a matter of commitment and a desire to help curb the effect of such unwarranted practices among the young. We can confirm that those who were involved in the exercise, be it interviewers or interviewees, were unanimous about the need for such exercises and the importance of sensitizing the young to the damaging effects of such actions on the part of young people.

Data Collection

Six hundred and forty five boys and eight hundred and forty girls aged between 12 and 19, reading in 80 secondary schools found in different areas of the island were interviewed on the three topics.

The sample population was from schools found in: **Rural** 310 (180 girls, 130 boys); **Urban** 945, (535 girls, 410 boys) and 230 (125 girls, 105 boys) from the **Coastal** region. (See Figure 4)

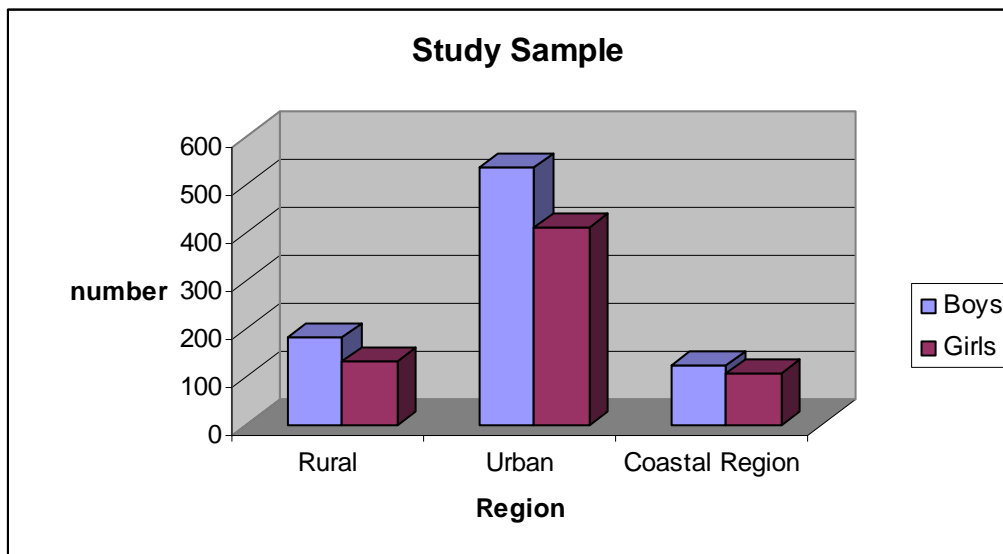


Figure 4: Study Sample

Data Analysis

Analysis of the data revealed some interesting features. On the use of mobile phones, in some cases all the students had a personal mobile phone in the urban schools. In the rural school population, 8 out of 10 had a phone while in the coastal schools 5 out of 10 had a phone. Internet were more easily accessible to the school students found in the urban schools; if they could not access it at school, most of them had it at home. The rural and coastal school students had almost the same problems getting access to the internet: unavailability of the facilities at school or at home; and the high cost of access to such information tools. Some of the higher income group families in the rural areas could afford to has access to internet facilities at home. The urban areas students were those with better opportunities to have access to IT, while the rural areas students were better off than their coastal counterparts in getting opportunities to get easy access to facilities in relation to Information Technologies. This was because of the cost of the required materials on the one hand, and to the problems of accessibility due to remoteness of certain regions from the website centers, and the geophysical morphology of the island.

Results

The mobile phones are used up to 10 to 15 times daily to send SMS to close friends, but are mostly used for dating. Some of the students, both boys and girls had up to 5 live contacts only for dating. The latest mobiles equipped with cameras were used to take snaps of girlfriends or boyfriends. Most of those interviewed stated that they shared pictures and other materials which they agreed were not appropriate for transmission among themselves.

Most of these were kept within close friends. Compromising pictures were shared and deleted as soon as possible. With the help of their friends who were well versed in the recent technologies they created possibilities for close circle friends to even have access to pornographic materials. These were inaccessible to parents and other adults as each had created their own passwords. The mobile phones equipped with cameras have been used to film scenes of lovemaking, and later used to blackmail the partners. Mobiles were used to inform parents of their whereabouts on private tuition days, if they were delayed because of traffic or personal matters. They were seldom used to talk to parents or relatives. Major use concerned close friends or dates.

The internet was mostly consulted on the eve of tests or exams. The internet is used in case of difficulties in finding materials for research projects, or for downloading important topics useful for school related tasks. More often the net is used to get the latest on their idols, singers, musicians, actors, films, clips, and other sites which are prohibited by parents, teachers and other adults.

There is an important exchange of video clips, songs, dances, and other erotic clips. Once someone has had access to “interesting” material, it is immediately given vast publicity and shared among friends. Nowadays, the most important news concerns sex and aphrodisiac pills and others. The net is flooded with these and the access is open to one and all having an e-mail. The publicity is so evident that no one can escape being caught by the temptation to have a quick glance, which in itself is enough to get your PC corrupted and infected with the latest viruses. The internet is also used to get people’s computers infected by sending them infected files. The internet, from a tool has now proved to be a formidable weapon to harm others. Sending emoticons, poison mails, faked news, harmful and degrading mails have become a more than regular feature one witnesses on the net. Mails sent to one can be sent to millions within seconds, without thinking of the harm done. The sender may not use his or her own name to forward any mail as soon as received; the recipients of the mail can do nothing than to forward the mail to other recipients despite knowing the consequences of such debase exercise.

As pointed out by many researchers, the cost of purchasing and maintaining IT equipments is a major obstacle to the promotion of Information Technologies in the various sectors of human life where such tools have proved to be indispensable. Many public and private institutions and families alike in many countries found in various regions of the world cannot afford to have access to ICT without important short-term and long-term investments, and the cost of appropriate maintenance to keep the instruments in working conditions. Despite the efforts of the government to extend credit facilities and low interest rates through bank loans for the purchase of PCs, the number of people ready to take the decision to make such move to get access to IT is still low. As pointed out , less than 25% of households have a computer and less than 20% have internet access at home (in KPMG 2007).

Discussions

The objective of this paper was to bring to mind not only the positive impact of the integration of IEC, ICT and IT in the life of people, but also the negative impact of the phenomenon on certain social aspect of their life as well. We wanted to call the attention of one and all to the costs society is paying in terms of the cyber crimes committed in the name of progress; the degradation of norms and values among young and old alike by the promiscuity created among individuals through the use of ICT; the ways in which emotions and feelings are made easy toys in the hands of millions; the havoc caused on the tender minds of the younger generations through cheap exposure and easy access to new baseless norms related to sex, sexual practices, erotic and pornographic materials; the opening of new ways to communicate not only positive but also negative aspects of human nature freely and cheaply; the tools that can harm the intimate and most sensitive nature of man by opening avenues to new methods of communication and harassment; minds that can corrupt, cheat, steal, fraud, and swindle in all impunity; commit crimes, and pave the way to ease actions from petty larceny to forgery through embezzlement has become child’s play for those who have become experts in the field of ICT.

Conclusion

Several international studies, both in the developed and developing countries are under way and it is hoped that the result of these studies will help authorities to review the ICT, IEC and IT policies for a better protection of the coming generations against the undesirable negative impact of

this new phenomenon. It is true that development and change bring in their trends unexpected elements which can very often defeat or counteract the desirable positive effects, but researchers are nowadays constantly warned about these, and thus can already work towards palliating if not avoiding these. We hope that the prime objectives set, when the writing of this paper came to mind, have been partly achieved, and that those who we expect to be sensitized and made aware of the need to establish protective measures have been alerted. Appropriate actions need to be envisaged and implemented the soonest possible.

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Biography



Dr. **Mahendrenath, MOTAH** is Senior Lecturer at the University of Technology, Mauritius. He has a PhD in Arts and Human Sciences from Paris VII, Jussieu University, Paris, France. He has spent one month in USA, as a Visitor under USIA in June 1987. He also attended the Laurentian University, Sudbury, CANADA in connection with the Distance Education Links Project, under CIDA in June 1995. He has participated in various Workshops, Seminars and Conferences at National and International levels.

He has extensive experience in the fields of Management, Administration and Training at both National and International levels. He is Chairperson of the Regional Centre for Urgent Anthropological and Ethnological Research. He has been appointed as Psychologist on the Monitoring Committee on the Protection of Elderly Persons Act, 2005 and is solicited to act as Resource Person in Consultancies and Training from Ministries and NGOs in Mauritius. He has presented papers at international conferences held in USA, Portugal, UK, and Slovenia.