Importance of ict in schools education essay

Education, Importance of Education

Abstract

The study analyses the level of integration of the information and communication technology (ICT) in the secondary schools in Mauritius. Hence, to execute this task, surveys were conducted with the educators and students from the secondary schools of Mauritius through questionnaire. Nevertheless, the perceptions of the administrative personnel were neglected as due to a preliminary study, no proper feedbacks were obtained from them concerning the topic of study.

The findings indicated that the educators and students do make heavy use of ICT in their daily teaching and learning process, which is a necessity in this fast changing world whereby ICT is taking over all fields. Therefore, integrating ICT in the education field, especially in the secondary schools will be very advantageous for the new generation of students.

Executive Summary

There has been a fundamental shift in the way in which work is completed and the nature of interactions in schools due to the increasing use of ICT. ICT is defined as any technology or device that has the capacity to acquire, store, process, or transmit information and can include personal computers, the Internet, mobile communication devices, and email.

However, comprehensive researches investigating the level of integration of ICT in the secondary schools have been carried out. The aim of this research is to assess the level of integration of ICT in the secondary schools in Mauritius. Moreover, this study also aims at identifying the factors that are

responsible to determine the level of integration of ICT in the secondary schools.

Results based on the analysis of data relating to 200 educators and 400 students show that computers are available in almost every house in Mauritius which reflects the vision of the government. Also, the new generation of students are computer literate due to the heavy use of ICT around them and are more likely to follow a career in the ICT field. And finally, ICT is seen as a very useful tool to enhance the teaching and learning process in schools.

Literature Review

According to Pelgrum and Law (2003) in the early 1980s, the term ‘ computers’ was replaced by ‘ IT’ (Information Technology) which mean a shift from computing technology to the capacity to store and retrieve information. Hence, the term ‘ ICT’ (information and communication technology) was brought forward around 1992 (Pelgrum, W. J., Law, N., 2003).

Another definition says that ICTs include the networks and services which affect the local and global accumulation and flows of public and private knowledge (Adeya, N. C., 2002). In addition, Adeya (2002) came forward with a simplified definition describing ICTs as an ‘ electronic means of capturing, processing, storing and disseminating information’.

The term ICTs involves multimedia, the Internet or the Web, as a medium to enhance instruction or as a replacement for other media (Pelgrum, W. J. Law, N., 2003).

ICT in Education

The widespread use of Information and Communication Technologies (ICT) has till now influenced all fields in life, among which lies education. Many countries see ICT as a potential tool for change and innovation in the education field (Erdogan, 2009, adapted from Eurydice, 2001; Papanastasiou & Angeli, 2008) and thus, they make large investments in the integration of ICT in schools. For example, Europe and Central Asia allocate 22% of their budget to ICT (Erdogan, 2009, adapted from World Bank, 2007).

According to Pelgrum and Law (2003) ICT in education became popular in educational policy-making in the early 1980s, when consumer market began the sale of cheap microcomputers. These intellectuals also noted that by the early introduction of microcomputers in education in 1980s, education was expected to be more effective and motivating.

Hepp, Hinostroza, Laval and Rehbein (2004) advocated in their paper “ Technology in Schools: Education, ICT and the Knowledge Society” that ever since the inception of ICTs in education, they have been used but not to its maximum.

Although in the early 1980s computers were not been fully integrated in the learning of traditional subjects, the commonly accepted perception that the

system of education would have to prepare the students for a knowledgeable society increased the interest in ICTs (Pelgrum, W. J., Law, N., 2003).

Moreover, Kozma and Anderson (2002) write in their paper " ICT and Educational Reform in Developed and Developing Countries" that for an economy to be knowledgeable education should be its primary necessity. Simultaneously, the teaching strategies in schools are bending towards ICT. This change towards ICT has been very dramatic. Similarly, Kozma and Wagner (2003) agreed on that idea that the ICT will enhance the basic education and is a very challenging field of development work nowadays, in both poor and wealthy nations (Wagner, D., Kozma, R., 2003).

Additionally, still in the field of ICT in education, Ezer (2005) points out that ' the ICT for development literature often treats education ' in passing".

Importance of ICT in schools

ICT can be used in three ways at schools: for teachers to present, assess and monitor knowledge; to enhance administrative work; as " learning content in relationship to students' information literacy" (Myungnghee Kang et al., 2011).

STUDENTS:

Over the past few years, several large-scale international studies have documented the successful integration of ICT in schools (Lim & Hang, 2003, adapted from Mann, Shakeshaft, Becker & Kottkamp, 1999; Sivin-Kachala, 1998; Wenglinsky, 1998). These research studies have shown that ICT facilitates the acquisition of higher order thinking skills by providing

cognitive scaffoldings for students as they make sense of the information gathered; allowing experts, teachers and students to communicate their thoughts and interests in subject matters and simulating real-life situations and problems for students as they explore the connections between concepts and ideas.

21st century children choose to look for answers to their questions on the internet (Myungnghee Kang et al., 2011). Also, students who had followed ICT courses had more possibilities of being employed as most of the jobs nowadays require a good knowledge of ICT.

Research studies have brought forward the fact that the use of ICT as well as other teaching strategies have enabled students to move to higher-order thinking (Jonassen & Carr, 2000; Kearney &Treagust, 2001; Oliver & Hannafin, 2000). Thus, students develop constructive thinking skills. As a result the students are learning in order to prepare themselves for the future information age.(Salomon, 1993). According Kozma (2005) ICT can be used to enhance student understanding thus increasing the quality of Education.

In addition, Papert (1997) noted the advantages of ICT for students and they may be as such: the students are more motivated and as such they become more creative when they are faced with new learning environments. Also, they are prone to assimilate in a disciplined way working collaboratively with their peers. As a result, they are able to generate knowledge. They will have the capacity to handle rapid change in any type of environment.

Some theorists acknowledge that ICT can help students to become knowledgeable, reduce the extent to which direct instructions are given to them, and give educators a chance to help those students with special educational needs needs (Iding, Crosby, & Speitel, 2002; Shamatha, Peressini, & Meymaris 2004; Romeo, 2006).

EDUCATORS:

The integration of technology in schools has brought about changes to teachers' roles in the classroom. The classrooms where technology is being used have their teachers often compared to that of a facilitator or coach rather than a lecturer (Gahala, 2001, adapted from Henriquez & Riconscente, 1998).

As educators use ICT in classroom, their teachings are proved to be very fruitful. Hence, in order to be at such level training is a must for all educators so that they acquire sufficient expertise for effective teaching. As a pedagogical tool ICT can provide a new framework so as to improve teaching. Hence, learning will be done in a collaborative, project-based as well as self-paced way.

As students become more independent, teachers who are not familiar to act as facilitators or coaches may not understand how technology can be used as part of activities that are not teacher-directed. This is a situation where the teacher gets an excellent opportunity to learn from the students as well as to model being an information seeker, lifelong learner and risk taker.

As part of their job requirements, teachers are expected to use technology tools in many cases. As technology continue to impact on teaching and learning, expectations on teachers to exploit technological advantages will rise, leading teachers to experience the pressures of having to toggle between pedagogy and technology in a seamless way (Teo, 2011, adapted from Pelgrum, 2001). The extent to which this is well-executed depends on teachers' willingness to employ technology in teaching and learning. When teachers do not use technology the way it was designed to serve, the affordances of technology cannot be maximised for effective teaching and learning to take place. For this reason, many studies on technology acceptance have been conducted over the years and it appeared that these studies had focused on the identification of factors that influenced technology acceptance among teachers and students. These included personal factors such as attitudes towards computers (Teo 2011, adapted from Teo, 2008; Teo & Noyes, 2011), computer self-efficacy (Teo 2011, adapted from Tsai, Tsai & Hwang, 2010), technical factors such as technological complexity (Teo, 2011, adapted from Thong, Hong & Tam, 2002) and environmental factors such as facilitating conditions (Teo, 2011, adapted from Ngai, Poon & Chan, 2007).

ADMINISTRATORS:

In fact, academic institutions typically lag businesses by roughly a decade in the adoption of new technologies (Leidner & Jarvenpaa, 1995, adapted from U. S. Congress, 1988). This is certainly true in terms of the application of ICT into the learning process: the blackboard and chalk remain the primary

teaching technologies in many schools even while the merits of ICT to improve communication, efficiency, and decision making in organizations are recognized and inculcated by researchers.

ICT is important because of the expansive use of automated systems in all activities. ICT has become important in research, library, documentation, etc. Technologies have opened a new door for human activities.

According to Hepp, Hinostroza, Laval and Rehbein (2004) in view of increasing productivity, ICT should be seen as a very important tool in education from classroom to the top management team. ICT play the role of diminishing the burden of the administration of the school, hence there will be the prevalence of a more effective as well as integrated flow of information among teachers, students and non-teaching staff.

Policies in Integrating Technology in Schools

Hepp, Hinostroza, Laval and Rehbein (2004) pointed out that for an ICT policy to be effective, it should not be brought forward alone but rather, there ought to be a comprehensive effort so as to improve the equity and quality of the structure of education.

In the same wave of thinking, Levine (1998) put emphasis on the importance of bringing forward a plan which is based on real school needs. Thus, it would be more realistic, achievable, and effective. The plan should be implemented just for the sake of bringing technology in the classroom. (Levine, J., 1998).

Hepp, Hinostroza, Laval and Rehbein (2004) have been very explicitly explained that there is no universal truth for applying ICTs in education. It all depends on each country’s reality, priorities and long-term budgetary prospects and commitment.

In Mauritius, The Master Plan on education was prepared in 1991 and identified ICT education as an important pre-requisite for the economic development of the country.

According to the Master plan, of 1991

I. T. will play an increasingly important role in creating the efficient, effective, and modern information services which will constitute the back-bone of a modern industrial economy. The future economic sectors in Mauritius will demand a highly skilled labour force that understand the strategic importance of information and will be able to exploit the benefits of technology to improve the competitive edge of Mauritius enterprise…The education system of Mauritius needs to take cognizance of these issues (p. 75).

According to the Master Plan of 1991, it was decided to use three long-term strategies, that of

extending Computer Literary to Form I and Form II students as well,

integrating ICT across the curriculum, and

offering Computer Studies or Information Technology as a specialist subject to those who wished to develop broader technology capability.

Only the first strategy has been implemented successfully to date whereas ICT has not yet been integrated in teaching and learning and Computer Studies remains a subject designed, monitored and assessed by University of Cambridge International Examinations.

The number of PCs has increased from a few hundreds in 122 schools to around 4, 800 in 189 schools.

But computer studies as a subject still attracts lesser candidates than many other subjects in the secondary school curriculum, around 26% at School Certificate level and 10% at Higher School Certificate level (Digest of Educational Statistics 2006, 2008).

The 2004 report of the Task Force on E-Education and E-Training proposed the provision of unlimited free Internet access to all schools.

To date, mostly secondary schools have been provided with Internet access

Sidelining of ICT in primary schools

More emphasis on the promotion of ICT among working population and the public at large much more often than in primary schools

In the National Strategic Plan (2006-2010),

barely a few lines are dedicated to ICT in schools.

While it is stated that there is growing need to develop connectivity among primary schools there is no mention of the strategy that the government will adopt to improve ICT infrastructure in schools.

In National ICT Policy 2007-2011,

the need to use ICT in education is stipulated without enough emphasis of how this policy will be implemented and how progress achieved will be measured.

Draft Education and Human Resources Plan (2008-2020)- Pre-Primary Schools

Embed technology in the system

To expose young learners to modern technology for familiarization purposes

Schools equipped with IT facilities by end 2009

Train teachers in ICT

Encourage pre-schools to use ICT as a tool in the teaching/learning process

Draft Education and Human Resources Plan (2008-2020) – Secondary schools

Introduce support technology in the system

ICT introduced in all schools for use by all teachers

ICT Plan developed for secondary schools by 2010

ICT used across the system by 2015

To provide ICT facilities to ensure that all teachers use ICT facilities on a regular basis for teaching and learning

Make provision for wider use of online materials and Knowledge Channel

All students leaving secondary are equipped with ICT skills to adapt to the requirements of future needs of independent learning

Even with a coherent and detailed policy and careful planning, ICT integration in education is a complex process. Various studies pointed out four main stages of ICT adoption and their use in education.

ƒ At the first stage which is the emerging stage in ICT development, the teachers and learners are discovering ICT tools and their general functions and uses, and the emphasis is usually on ICT literacy and basic skills.

ƒ The second stage involves learning how to use ICT tools, and beginning to make use of them in different disciplines. This involves the use of general as well as particular applications of ICT, and it is linked with the applying stage in the ICT development model.

ƒ At the third stage, there is understanding of how and when to use ICT tools to achieve a particular purpose, such as in completing a given project. This stage implies the ability to recognize situations where ICT will be helpful, choosing the most appropriate tools for a particular task, and using these tools in combination to solve real problems. This is linked with the infusing stage in the ICT development model.

ƒ The fourth stage is when the learning situation is transformed through the use of ICT. This is a new way of approaching teaching and learning situations

with specialized ICT tools, and it is linked with the transforming stage in the ICT development model.

Progression through the stages takes time. And the transformation of pedagogical practice requires more than ICT skills training for teachers. Too often the approach taken to teacher training in ICT integration is the one-off crash course on computer literacy. This approach does not enable teachers to integrate ICT in their day-to-day activities and master the use of ICT as an effective tool for teaching and learning.

Gender Issues of Research on Teachers' and Students' Use of ICT

As stated above that gender differences is among the factors that have been said to influence the level of integration of ICT at schools, it has been noted that male teachers are more active in the use of ICT than the female teachers. They feel more confident and less nervous towards the use of computers in their teaching-learning process as well as their technical ICT capabilities rather than the female teachers (Guoyuan et al., 2009).

Similarly, male students have significantly higher positive perceptions than the female students regarding the e-learning, which is an innovative use of ICT in the education field. For example, males had more positive attitudes than females towards the use of a digital library (Terzis & Economides, 2011, adapted from Koohang, 2004) and towards the use of web based instruction at an open university (Terzis & Economides, 2011, adapted from Enoch & Soker, 2006).

The current study aims at assessing the level of integration of ICT in the secondary schools in Mauritius. We shall be evaluating the usage of ICT in the day-to-day life at schools via the students, teachers and the people from the administration. In addition to this, this coursework also aims to test certain hypotheses like the gender issues of research on teachers' and students' use of ICT that were found to be relevant based on the factors that have been said to influence the level of integration of ICT at schools. This study attempts to determine whether these hypotheses hold good or not, in the Mauritian context.

Research Methodology

The aim of this research is to assess the level of integration of ICT in secondary schools in Mauritius. The study is also to determine the policies that influence in integrating ICT in schools. Both qualitative and quantitative methods have been used. Qualitative methodology has been utilized in the beginning of the research.

Questionnaires were based on a qualitative pilot study and a literature review as was described above. It comprises of questions probing user perceptions of ICT use in schools, the characteristics of the users and their usage habits and experience with ICT and the basic background information. A pre-testing of the questionnaires was done and then the questionnaires were distributed among students and educators of four secondary schools in Mauritius. At first, data were collected through personal interviews with people from the administration but unfortunately, no proper responses were

received and thus, the perceptions of the administrative personnel had to be neglected.

In this study, convenience sampling method was used. The fieldwork was carried out during the month of October 2011. Using the Raosoft website,

(i) with a 5 percent margin error, 50 percent response distribution, 90 percent confidence level and population size 2000, we get sample size around 200 for educators.

(ii) with a 5 percent margin error, 50 percent response distribution, 95 percent confidence level and population size 20000, we get sample size around 400 for students.

Out of the 200 questionnaires for educators, 184 proved to be very co-operative and showed real enthusiasm. 16 questionnaires were rejected due to missing information and inconsistencies by respondents. Also, out of the 400 questionnaires for students, 388 proved to be good feedback obtained while the rest of 12 questionnaires were rejected due to missing information.

The data gathered has been scientifically analyzed, with the use of statistical software called Statistical Package for Social Sciences (SPSS) 14. 0 for Windows.

This study suffers from several limitations. One limitation is that of sample size. Out of 200 questionnaires for educators, only 92 percent responded, out of which 16 questionnaires had to be disregarded and the same for the questionnaires of the students whereby 97 percent has been accepted and

the rest rejected. Because of the limited response, results may not be representative of the population in question. Also, some educators even refused to participate because they were either in a hurry or reluctant to give information.

Finally, had time and budget constraints not existed, the sample size employed could have been larger.

Analysis and Interpretations

Input and Coding

SPSS (Version 14. 0) was used to input the data from the questionnaires. The variables were defined in the Variable View and the data were entered as numbers in the Data View.

Educators' Questionnaire

1. From the Figure 1 below, it is noted that 94. 6% of the respondents do have a computer at home. This reflects the Mauritian government mission of making every house in Mauritius own a computer. Further to our survey, it has been noted that the educators are quite fluent in using a computer and its applications (refer to frequency tables in the Appendix Section).

2. From Figure 2, it is seen that the respondents who answered positively to the availability of the technological support at their schools, do find the quality of the service as being good (also refer to the crosstabulation in the Appendix section).

3. Nevertheless, the survey also revealed that most educators rarely make use of technology in their classes although they do have the necessary knowledge in ICT (refer to Figure 3 below).

4. Although that, referring to the gender differences as being among the factors that have been said to influence the level of integration of ICT at schools, it is shown from the figure below that male educators are more interested in using ICT in their classrooms than the female educators. The male educators feel more confident and less nervous towards the use of computers in their teaching-learning process as well as their technical ICT capabilities (Guoyuan et al., 2009).

5. Finally, the survey has been tested through Hypothesis Testing to determine whether ICT has been integrated according to the educators' perspective by the question describing their level of technology expertise in their classrooms. A confidence interval of 95% and a two-tailed testing (leading to z-value 1. 96) have been used.

Figure 5

Statistics

N

Valid

184

Missing

0

Mean

. 0598

Std. Deviation

. 23773

Variance

. 057

Figure 6

95%

Acceptance region

Rejection region Rejection Region

-1. 96 1. 96

Defining,

H0 = ICT has been integrated in secondary schools

H1= ICT has not been integrated in secondary schools

H0: Î¼ = 0. 0598

H1: Î¼ â‰ 0. 0598

Limits for acceptance,

± 1. 96 Ïƒ

0. 0598 ± [1. 96 * (0. 057/)]

0. 0598 ± 0. 008

0. 0518 < μ < 0. 0678

The sample mean 0. 0598 lies within the acceptance region and therefore we accept H0 and reject H1, that is ICT has been integrated in secondary schools.

Students' Questionnaire

1. According to the survey conducted with students, it is noted that the main function of a computer at the school if to look for resources on the internet and some of them do have lectures using the Powerpoint software (refer to Figure 7). This shows the new teaching and learning style using the facilities that technology provides.

Figure 7

2. Added to that, we have noted that all schools are equipped with computer labs and thus, provide computer as a subject of study. And also, the majority of these computer labs cater to provide each and every student of the school with the use of computers (refer to Figure 8).

3. The survey has also pointed out that the educators encourage the heavy use of ICT in the teaching and learning process and nowadays students do

make heavy use of ICT in their learning as they get most of the resources from the internet (refer to Figure 9).

4. Figure 10 below shows that most of the students do own a computer at home and thus, they are quite fluent in using the different tools of a computer both at home and at school. We conclude that nowadays students are all computer literate.

5. Similar to the concept of gender differences in the survey for educators, it is also shown for the students as well that the male students are more likely to use computers for their learning purposes than the female students (refer to Figure 11).

Conclusion

The effective integration of ICT in a learning environment depends on the way ICT is situated within that larger social cultural milieu. As ICT enters the sociocultural setting of the school, it ” weaves itself into the learning in many more ways than its original promoters could possibly have anticipated” (Lim & Hang, 2003, adapted from Papert, 1993). There is a context for the ICT experiences that encompasses activities peripheral to the particular times and formats of the ICT interaction itself.

Our study has provided insight into the nature of students’ and educators’ thinking processes on the potential level of ICT integration in the Mauritian context. The findings suggest that successful ICT integration is clearly related to the processes within the classroom such as teacher beliefs,

teacher efficacies and teacher attitudes as well as student participation and student interest towards ICT.

Also, ICT is an important tool in the educational procedure. This study investigates how gender poses as a factor that influences the integration of ICT in secondary schools.

Referring to our aim of the study which is assessing the level of integration of ICT in the secondary schools in Mauritius, it can be concluded that ICT has effectively and efficiently been integrated in the secondary schools of Mauritius but nevertheless, there are improvements to be brought about to the proper functioning of the technology tools in the education sector to enhance the teaching and learning process.