Research Article

EXTENT OF INFORMATION AND COMMUNICATION TECHNOLOGY UTILIZATION IN TEACHING: ITS INFLUENCE ON STUDENT’S ACADEMIC PERFORMANCE

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ABSTRACT

This study wanted to investigate how the extent of Information and Communication Technology (ICT) Utilization in teaching influences students’ academic performance among small, medium and large type of school in Public Secondary Schools in District 2 of the DepED Division of Bulacan as basis for program enhancement. The simple descriptive survey research methods were employed in exploring the influence between variables. Frequency distribution and weighted mean were also engaged to describe the availability of hardware and software resources. Frequency count and percentage were also used in presenting the data on student-computer ratio and internet access. The extent of utilization of ICT in teaching towards students’ academic performance in Math, Science and English subject was statistically analyzed using Regression analysis to determine the best predictor among the independent variable (IV) to the dependent variable (DV). In this study, it was found that the extent of teachers’ ICT utilization in teaching did not serve as significant predictors of the respondents’ academic performance and that there is no sufficient evidence to say that there is a significant relationship between independent and dependent variables. Then the model of no effects can be observed or that the obtained insignificant values were due to chance alone or other extraneous variables or factors. An ICT Program was also derived from the findings of the study that would benefit the needs of the Department of Education in Bulacan when it comes to ICT utilization.

KEYWORDS: ICT, Teaching Influences and Academic Performance

INTRODUCTION

It is almost more than twenty years ago; Deaton (2014) stated that whether or not we touch a computer, it is almost impossible to escape their daily influence on us; from speedy information transmittal, printouts, and receipts, to control of lights and temperature of our work places; (Al-Mujaini 29, 2006). Today, we have a term; Information and Communication Technology (ICT) which has gained popularity recent years. It encompasses the effective use of equipment and programs to access information, and store, organize, manipulate and present it (Gay & Blades, 2005). It is reported by Organization of Eastern Caribbean States (OECS, 2002) those in recent years ICT, and is continuing to have, an increasingly significant impact on all aspects of society. There are few areas of life, at home, at school and in work, where this new technology has not made an impact. ICT expands our 33 accesses to, and understanding of the world at large. Information and communication technology can be used as a personal tool, but also people can benefit from ICT in order to engage in collaborative activities, and to get local and worldwide communication (OECS, 2002).
It is also a vital means for social change and economic development that is seen as an essential tool for developing countries. It is explained in the book published by World Bank (2006) that the world’s policy makers have recognized the significance of ICT which offers primary inputs for economic development, contributes to global integration and also improves the effectiveness and efficiency of public sector. As a result, for governments, it became a priority to improve ICT access and quality. In her report to the UNESCO in 2003, Tinio cited the lack of ICT based-instructional materials that will aid teachers in using ICTs as teaching and learning tools as one of the constraints, among others, to the effective integration of ICT in basic education. Other factors include: poor student to computer ratios (averaging 267:1); lack of appropriate/relevant software; lack of connectivity; low level of basic ICT skills among teachers; and lack of funds to pay for the cost of running the ICT facilities. To remedy these deficiencies, the Department of Education has undertaken specific programs for the next few years on the effective and efficient implementation of ICT in basic educational system. One of these is the Staff Development Program, which aims to provide teachers, school heads and support staff with appropriate skills and behavior to support the changes brought about by ICT (PIA, 2006). In the DepEd Division of Bulacan for instance, training on ICT integration was conducted to help teachers design and develop instructional technologies.

The division wide in-service training aimed at acquainting the teachers with the various instructional technologies for teaching and learning. In addition, its purpose was to identify areas in teaching where ICT-based instructional materials may be appropriate and pertinent, and developing teaching aids or creating simple projects to enhance the learning process in the areas identified (DepEd Division of Bulacan, 2010). Underlying the aim of integrating and improving the use of ICT by students is an assumption that teachers themselves are competent and confident in the use of ICT in terms of teaching and learning. A report from the Officer of the Auditor General released in 2001 indicated that over 95% of teachers interviewed assessed themselves as having more than a basic level of ICT operational skill. The majority of these teachers were not, however, confident about applying ICT to facilitate student learning. These outcomes were consistent with teacher self-reports collected by the Department in the development of the Learning Technologies Planning Guide for Schools Using Information Technology to Improve Teaching and Learning, (2000). Presently, the effective utilization of ICT in the basic education curriculum to achieve quality education remains a vision to realize.

Although the Department of Education’s national computerization programme, as reported by Tinio (2003) of the Foundation for Information Technology Education and Development Inc., Philippines (FITED), that includes provision of computers, software, peripherals, and teacher training that has benefited 56.4% of the public secondary schools in 2001 and consequently 75% of the public secondary schools in 2005, it has not improved students’ performance in Mathematics and Science as based on TIMSS results in 2004 and the National Achievement Test results in 2006 where majority of the secondary school students failed to achieved the required competencies in all learning areas. To address the alarming deterioration in the students’ academic performance, President Gloria Macapagal-Arroyo called for the utilization of information technology in the Philippine Educational system particularly in the basic education curriculum (Smart Schools, 2006).

In her speech during the first National Information Communication Technology in Basic Education Congress, she underscored the important role of teachers as the key players in achieving knowledge economy through ICT and this can be realized through innovative instructional technologies (Speeches, 2004). ICT education will be an important aspect as they formulate an effectively enhanced K to 12 Basic Education Curriculum. We have to set up our 42 ICT thrust as we gradually implement the K to 12 Basic Education Reform Program as we all know ICT plays a very important role in administrative functions as well as in the teaching and learning process, (Luistro, 2012). This study therefore assesses the extent of ICT utilization in teaching and its influence on the students’ academic performance. Results that may be drawn from this study may bring implication as basis for program enhancement. It is this premise that the researcher is inspired to pursue this study.

STATEMENT OF THE PROBLEM

The main purpose of the study was to determine the extent of Information and Communication Technology (ICT) integration in teaching and its influence on students’ academic performance as a basis for program development in Public Secondary Schools in EDDIS II- Division of Bulacan for School Year 2013-2014.

Specifically, this study attempted to answer the following problems:

1. How may the provision of ICT equipment/facilities be described in terms of:
   i. availability of computer hardwares and software
   ii. student-computer ratio
   iii. internet access

2. What is the extent of utilization of ICT in teaching in terms of the following requirements:
   i. hardware
   ii. software

3. What is the level of students’ academic performance in the following subject grade?
   i. Mathematics
   ii. Science
   iii. English

4. Does the extent of ICT utilization significantly influence students’ Academic Performance?
5. What implications may be drawn from the result of the study that would serve as basis for ICT program enhancement?

MATERIALS AND METHODS

Research Design

Descriptive correlation method of research was employed in the study. It is conducted simply to describe individual variables as they exist naturally (Gravetter et.al, 2009). It involves the description, recording, analysis and interpretation of the present nature, composition or process or phenomena. A correlation design is appropriate for this study because it allows two variables to show if they have a positive or negative relationship. Since this study examined the extent of ICT utilization in teaching and students’ academic performance, the descriptive correlation method of research would be the most appropriate method in determining the degree of relationship between two or more variables. Essentially, questionnaires were used as primary data gathering tools. Document analysis was utilized as a secondary source and used to help the researcher in obtaining and analyzing the statistics to be used in the study and in gathering data needed.

Locale of the study

The subjects of this research were teachers and students from the Grade 7 level of Public secondary schools in EDDIS II–Division of Bulacan as of School

Year 2013 to 2014. The list of schools was taken on the data of the Enhance Basic Education Information System (E-BEIS). This study covers 142 teachers which comprise 100% of the total population of teachers from Grade 7 in public secondary schools in EDDIS II–Division of Bulacan.

RESULTS AND DISCUSSION

The size of the school is a great factor on the availability of computer hardware and software resources. This shows that for small schools, hardware resources such as overhead projector, Handheld/PDA, laser printer, powder printer and devices for digital imaging and video processing were not available while desktop computers were very available. However, availability of computer Hardware resources for medium schools such as overhead projector, handheld/PDA and devices for digital imaging and video processing were also not available while television, VCD/DVD player, cassette, radio, video/digital camera, laptop, desktop, and inkjet printer were moderately available. On the other hand, LCD projector, tablet pc, android and mobile phone, scanner, DVD writer and all types of printer got somewhat available.

Further, the table also manifested that in large schools, DVD player, laptop/netbook, desktop, mobile phone and inkjet printer got very available while LCD Projector, Television (TV), Cassette/Radio, Video/ Digital Camera, Android Phone, Scanner, CD/DVD writer and Dot Matrix Printer was perceived as moderately available. Overhead projector, Tablet, laser and powder printer and devices for imaging processing got somewhat available.

In general, availability of computer hardware resources among small and medium schools in Public Secondary in District II was perceived as somewhat available. This implies that there are insufficient hardware resources among small and medium schools while the large school utilizes various ICT hardware resources for various task and applications in teaching.

The availability of software resources came out with Moderately Available and is not a determinant in most schools. For small schools, spreadsheet, presentation and email software got the highest availability which is very available, while word processing, graphics, chatting platform, database, encyclopedia references, recreation and educational games, photo editing and web design software got the next rank which is moderately available.

However, simulations, programming languages, web designing and statistical software is said to be somewhat available. Although database, encyclopedia references, educational game and mathematical programs got somewhat available and programming language is the only software not available for medium schools. Large schools got encyclopedia references and photo editing software as very available, while moderately available for spreadsheet, presentation, email, graphics, chatting form, database, recreation and educational games, simulations, programming languages, web designing and statistical programs. Further, software like word processing and desktop publishing got somewhat available. Since teachers are competent to utilize the computer, they can source out every software resources that are available. The finding also implies that among the software resources available in the study, spreadsheet, presentation and email software was commonly used as perceived by the respondents. Student-Computer Ratio. Adequate computers for students used are enough to sustain the ideal period of time in using the computers. This also implies that Grade 7 subjects in public secondary schools in EDDIS II are meeting the standards when it comes to student-computer ratio especially to large or big schools.

Small schools utilization of ICT hardware resources like VCD/DVD player, laptop/ net book and desktop computers were utilized to a moderate extent while LCD projector, television, cassette/radio, digital camera, tablet pc, android phone, mobile phone, scanner, DVD/CD writer, inkjet, dot-matrix, and laser printer were utilized to a least extent. Meanwhile, Handheld PDA, overhead projector, powder printer and devices for digital imaging and video processing was not applied at all. To a moderate extent of utilization was evident for medium schools in the following resources: television, VCD/DVD player, video/digital camera, laptop/net book, desktop computers, mobile phones and CD/DVD writers.

On the other hand, LCD projector, cassette/radio, tablet pc, android phone, scanner, all types of printer and devices for imaging and video processing were utilized to least extent while hardware resources like overhead projector and handheld/PDA was not applied at all. Moreover, to a
great extent of utilization was evident for the following resources in large schools: laptop/net book, desktop, Handheld/PDA, CD/DVD writer, inkjet printer, laser printer and devices. For digital imaging and video processing. Other resources like LCD projector, television, VCD/DVD player, cassette/radio, digital camera, tablet pc, scanner, and dot matrix printer were utilized to a moderate extent. However, the utilization of an overhead projector for large schools was functioning poorly or not applied at all. It is due to the fact that there is no available overhead projector for large schools. In general, hardware resources for small and medium schools were utilized by the teachers to least extent while for large schools it was utilized to a moderate extent ICT utilization for large schools was adequate and functioning well while for small and medium schools the extent of ICT utilization for hardware resources is said to be to least extent

Software resources like spreadsheet and presentation software were utilized by teachers to a great extent for small schools while word processing, email software, graphics, chatting platform and educational games to a moderate extent. This means that this type of software was extensive and functioning well. Furthermore, to least extent of software utilization was evident to database, encyclopedia references, recreational games, photo editing, desktop publishing, simulations, programming languages, web designing and statistical/mathematical software. Software resources for medium schools like spreadsheet, presentation software and email software were utilized to a great extent while word processing, graphics, chatting platform, encyclopedia references and educational games to a moderate extent.

However, database, recreation games, photo editing, desktop publishing, simulations, programming languages, web designing and statistical/mathematical programs were utilized to least extent. Most of the software resources for large schools were to a moderate extent like word processing, spreadsheet, graphics, chatting form, database, encyclopedia, recreation games, programming languages and web designing software while presentation, email software, educational games, photo editing, desktop publishing, and statistical/mathematical was to a great extent and only simulation software were utilized to least extent. The extent of software utilization in teaching among secondary schools in EDDIS II particularly small, medium and large schools was to a moderate extent. This means that there was still so much to be desired in terms of teachers' ICT software utilization.

The tabular values show that among the three types of schools, the large school gained 89.61% as evidenced by the overall weighted mean with a standard deviation of 1.55 followed by medium school with an average weighted mean of 88.87% and 1.40 as its standard deviation. Lastly, small schools got 87.64% of the average weighted mean and 1.10 as its standard deviation. 39 The study simply means that Grade 7 students in Public Secondary Schools in EDDIS II are proficient enough since majority of them obtained a very satisfactory grades.

CONCLUSIONS

Based on the aforementioned findings of the study, the following conclusions were derived:

i. Provisions of ICT equipment/facilities in terms of availability of computer hardware and software resources can be described as somewhat available. This implies that there are inadequate or no enough resources or ICT facilities among the three types of schools that can be used for various task and applications in teaching.

ii. Adequate computers for students used are enough to sustain the ideal period of time in using the computers and that Grade 7 subjects in public secondary schools in EDDIS II are meeting the standards when it comes to student-computer ratio.

iii. Investment on internet connectivity among secondary schools must also be prioritize which commonly has no enough funds to sustain internet connections aspart of ICT utilization. The extent of ICT utilization in teaching for both hardware and software requirements was to a moderate extent.

iv. Teacher should be acquainted with the use ICT facilities/equipment and upgrade their level on Technology resources. The level of students' academic performance in Math, Science and English are all within proficiency level ranging from 87.18% to 89.80% since majority of them obtained a very satisfactory grades.

v. The extent of ICT utilization in teaching has no significant effect or no influence on students' academic performance for Math, Science and English subject. Likewise, it did not serve as significant predictor. An Enhance ICT Program was evolved from the findings of the study to further improve utilization of Information and Communication Technology resources and will benefit Public Secondary Schools in DepEd Division of Bulacan.

for every school, increasing the productivity of the public school teachers for both teaching and non-teaching related activities through ICT and Improving the teaching-learning process among teachers and students through the use of technology in education.
RECOMMENDATIONS

After a thorough assessment of the findings of this study, the following recommendations were presented:

i. DepED of Bulacan should look into other sources of Funds and some linkages for the provisions of ICT Hardware and Software Resources. That they should be supportive in providing basis 74 for better educational planning management in the distribution of ICT equipment and implementation of various programs related to Information and Communication Technology.

ii. Teachers in Public Secondary Schools in DepEd Division of Bulacan should be given proper training, professional advancement on ICT literacy, and familiarization with ICT resources for enhancement of classroom teaching and learning process.

iii. That Teachers in Public Secondary schools should continue teach their students and do their best to maintain proficiency level of academic performance in a manner that they can best cope up with the difficulties in learning the subjects.

iv. Future researchers must continue the investigation in other fields of specialization and include other factors not mentioned in this study. That the DepEd Division of Bulacan may consider ICT Program enhancement derived from the findings of the study to further improve 79 teachers ' and students ' utilization of ICT. 

REFERENCES


