

**IMPLEMENTATION OF INFORMATION AND  
COMMUNICATIONS TECHNOLOGY IN  
PUBLIC ELEMENTARY SCHOOLS IN  
THE DIVISION OF AGUSAN  
DEL NORTE**

by

**Cherry Beloved Pabayo Magbanua**  
cherrybeloved.magbanua@gmail.com

**Abstract**

This study was an outgrowth of the researcher's desire to ascertain the implementation of Information and Communications Technology (ICT) in public elementary schools in the Division of Agusan del Norte. Specifically, this study sought to find out the teachers' and pupils' basic computer literacy skills in terms of general skills, file management skills, word processing skills, printing skills and online communication, browser and navigation skills. Moreover, the readiness of the schools in implementing ICT were determined in terms of availability of multimedia facilities, class schedule of teachers and pupils, availability of internet connections and support mechanisms. Furthermore, it aimed to ascertain the determinants of schools in the implementation of ICT. It likewise sought to find out the difference between the teachers' and pupils' perceptions on the readiness of schools in the implementation of ICT.

The descriptive-comparative type of research design was used in this study. A researcher-made questionnaire was assessed by 63 teachers who were purposively considered and 342 pupils who were sampled through the Raosoft software. The level of readiness of schools in the implementation of ICT among the variables was also tested. Statistical tools used were frequency, percentage, weighted mean, t-test and Stepwise Multiple Regression Analysis.

The findings of the study revealed that the public elementary schools in the Division of Agusan del Norte

were very ready in implementing ICT based on the basic computer literacy skills of teachers and pupils. Further, the schools were ready as to availability of multimedia facilities and class schedules of teachers and pupils. However, schools are only a bit ready as to the availability of internet connections and support mechanisms. Moreover, there was no significant difference in the perceptions of teachers and pupils on the level of readiness in the implementation of ICT. This study further emphasized that availability of multimedia facilities, class schedules of teachers and pupils, availability of internet connections and support mechanisms were determinants in the implementation of ICT in public elementary schools. It was therefore concluded that public elementary schools were already ready in implementing this program. Based on the conclusions made, it was recommended that the school and stakeholders would put their resources together for the smooth implementation of ICT in schools.

## **Introduction**

Technology has brought numerous transformations, challenges and innovations in the field of education. In all aspects of life, technology directly affects negatively and positively the development of the fast-changing environment (Dotong, De Castro, Dolot, & Prenda, 2016). The benefits of such advancement in computer technology has tremendously succeeded in its objectives of providing convenience in the way people learn and communicate through receiving, sending and processing information that makes everything moves faster than ever.

The Department of Education is currently expanding the reach of information and communication technology in public schools, both elementary and secondary to enable Filipino teachers and students to face the challenges in the age of technology. The advocacy in integrating ICT in education can only redound to the benefits of Filipino public school children in making quality education easily

accessible to as many learners possible (Mariano, 2014).

The use of Information and Communication Technology (ICT) in teaching and learning has become very common these days. Access to information increases the awareness of students, help them in increasing thinking and creativity in learning tasks, provide quick access to subject materials and engage them in adopting strategies which can help in maximizing the quality of learning. The process of learning become impressive if students have access to latest information on subjects; analyze information quickly by manipulating the computers through graphical displays and experiments and effectively communicate results and conclusions using the technical tools (Carbonilla Gorra & Bhati, 2016). On the other hand, technology can also be used to distract students in the classroom from their learning activity. Technical tools like laptops and mobile phones can cause disruption to classroom activity, if not used properly. Technological resources such as computers, laptops and mobile phones used in teaching and learning activities have both constructive and destructive effects on academic environment affecting both students and teachers. The use of technical and instructional innovations sets off a chain of actions and reactions within education system, some of which are intended and others unintended.

DepEd Order No. 78, s. 2010 shows the Guidelines on the Implementation of the DepEd Computerized Program (DCP), which caters the program components for elementary schools. One in the E-Classroom Model multimedia classroom package 1 Host Personal Computer (PC) (Branded and Brand new); six 17" Liquid Crystal Display (LCD) Monitor (Branded and Brand new); 6 Keyboard and Mouse (Branded and Brand new); 2 kits of Desktop Virtualization using shared computing technology (Branded and Brand new); 1 Uninterruptible Power Source

(UPS) (Branded and Brand new); 1 Interactive Whiteboard (Branded and Brand new); 1 3-in1 inkjet Printer (Branded and Brand new); 1 Liquid Crystal Display (LCD) Projector (Branded and Brand new); set of Face to face lecture and hands-on training for desktop virtualization using shared computing technology and 1 laptop.

Information and Communications Technology (ICT) in schools play an important role in pupils' career development. Computer with the internet is the most powerful device that pupils can use to learn new skills and more advanced version of current lessons. Schools are around the globe teaching pupils' basic of computers and internet (Sharma, 2016).

This study is beneficial to the top management for it would provide data regarding the implementation of ICT in the schools, districts and divisions.

### **Theoretical Framework**

Activity theory provides a context of human activity and proposes a set of practices which link individual to social activity (Engestrom, 1999). Activity theory provides all the necessary tools for a theoretical and methodological approach in the design and analysis of educational activities, which include much more than a tool that mediates between the subject and the objectives of teaching (Barab, 2003). Activity theory has applications in different fields of educational psychology (Koschmann, 1996), in human-computer interactions (Kuutti, 1996; Nardi, 1996) and in the design and analysis of educational activities (Barab, 1999).

### **Statement of the Problem**

This study aimed to ascertain the implementation of Information and Communications Technology in public elementary schools in the Division of Agusan del Norte. Specifically, it endeavored to answer the following questions:

1. What are the basic computer literacy skills of teachers and pupils on:

- 1.1. general skills
- 1.2. file management skills
- 1.3. word processing skills
- 1.4. printing skills
- 1.5. online communication, browser and navigation skills

2. What is the level of readiness of public elementary schools in the implementation of ICT as to:

- 2.1. availability of multimedia facilities
- 2.2. class schedules of teachers and pupils
- 2.3. availability of internet connections
- 2.4. support mechanisms

3. Which of the independent variables singly or in combination determine the readiness of the implementation of ICT?

4. Is there a significant difference between the perceptions of teachers and pupils in the readiness of schools in the implementation of ICT?

5. Based on the findings on this study, what intervention program can be proposed?

## **Hypotheses**

The study was guided by the hypothesis stated in null form.

Ho<sub>1</sub>. None of the independent variables singly or in combination determine the readiness in the implementation of ICT.

Ho<sub>2</sub>. There is no significant difference between the perceptions of teachers and pupils on the readiness of elementary schools in the implementation of ICT.

## **Summary**

Based on the findings in this study, it can be deduced that the teachers and pupils were very ready with their basic computer literacy skills specifically with their general skills, file management skills, word processing skills, printing skills and online communication, browser and navigation skills.

Moreover, the schools were ready in their ICT implementation as to availability of multimedia facilities and class schedules of teachers and pupils. However, internet connectivity and support mechanisms were only a bit ready.

Further, Stepwise Multiple Regression Analysis revealed that availability of multimedia facilities, class schedules of teachers and pupils, availability of internet connections, support mechanisms and basic computer literacy of teachers and pupils entered as important determinants in the readiness of schools in the implementation of ICT.

Finally, there is no significant difference between the perceptions of teachers and pupils in the implementation of ICT.

## **Conclusion**

Based on the foregoing findings and summary, the researcher concluded that the teachers and pupils were very ready with their basic computer literacy skills specifically with their general skills, file management skills, word processing skills, printing skills and online communication, browser and navigation skills. However, an enhancement of their skills will be very much appreciated.

Moreover, the schools were ready in the ICT implementation as to availability of multimedia facilities and class schedules of teachers and pupils. However, internet connectivity and support mechanisms were only a bit ready.

Further, multimedia facilities, class schedules of teachers and pupils, availability of internet connections, support mechanisms were considered important determinants in the implementation of ICT.

Finally, there was no significant difference between the perceptions of teachers and pupils in the implementation of ICT in terms of availability of multimedia facilities, class schedules of teachers and pupils, availability internet connections and support mechanisms.

## Recommendations

Based on the foregoing data the following recommendations were offered for consideration:

The Division and District offices may continue monitoring the implementation of ICT in their respective jurisdictions by finding ways and means to secure adequate internet connection, multimedia facilities and other support mechanisms.

School principals may include internet connection expense in the School Improvement Plan (SIP) particularly in their school MOOE. They may also look for some support mechanisms in terms of ICT maintenance.

Since the pupils' basic computer literacy skills were in the ready level yet, they may engage themselves on an intervention activity to further enhance or improve such skills to a very much ready level.

The future researchers may conduct a follow up study on ICT employing other variables not included in the present study.

## References

- Afshari, M., Abu, Bakar. K., Wong S. L. & Afshari M. (2010). Principals' level of computer use and some contributing factors. *International Journal of Education and Information Technologies*, 2(40), 121-128.
- Aghajani, H., & Zamani, B. E. (2012). An investigation of the factors influencing the Internet usage by engineering faculty members for doing scientific and research activities. *Interdisciplinary Journal of Contemporary Research in Business*, 3(11), 742-752.
- Ainley, John (2018). Student and their computer literacy: evidence and curriculum implications. Retrieved on August 17, 2018 from [https://link.springer.com/referenceworkentry/10.1007%2F978-3-319-7105-71054-9\\_4](https://link.springer.com/referenceworkentry/10.1007%2F978-3-319-7105-71054-9_4)

- Anandan, K., & Gopal, B. (2011) Information and communication technology in classroom instruction, EDUTRACKS. Retrieved on September 14, 2018. Retrieved from [http://shodhganga.inflibnet.ac.in/bitstream/10603/36053/8/08\\_chapter%202.pdf](http://shodhganga.inflibnet.ac.in/bitstream/10603/36053/8/08_chapter%202.pdf)
- An, Y.-J., & Reigeluth, C. (2011). Creating technology-enhanced, learner-centered classrooms:K–12 teachers' beliefs, perceptions, barriers, and support needs. *Journal of Digital Learning in Teacher Education*, 28(2), 54–62.
- Arayata, M. (2017). DepEd boost ICT in schools. Retrieved on September 13, 2018 from <http://www.pna.gov.ph/articles/1018975>
- Barab (1999). Activity theory on ICT. Retrieved on January 5, 2019. Retrieved from [https://link.springer.com/chapter/10.1007/978-94-6091-317-4\\_6](https://link.springer.com/chapter/10.1007/978-94-6091-317-4_6)
- Bhalla, J. (2013). *Education and training studies*. Computer use by school teachers in teaching-learning process. Jamia Millia Islamia, India: Redfame Publishing
- Buabeng-Andoh, C. (2012). An exploration of teachers' skills, perceptions and practices of ICT in teaching and learning in the Ghanaian second-cycle schools. *Contemporary Educational Technology*, 3(1), pp 36-49.
- Bordbar, F. (2010). English teachers' attitudes toward computer-assisted language learning. *International Journal of Language Studies*, 4(3), 27-54.

- Carbonilla Gorra, Virginia & Bhati, S. S. (2016). Students' perception on use of technology in the classroom at higher education institution in Philippines. *Asian Journal of Education and E-Learning*, (04).
- Dashtestani, R. (2012). Barriers to the implementation of CALL in EFL courses: Iranian EFL teachers' attitudes and perspectives. *JALT CALL Journal*, 8(2), 55-70.
- Dotong, C., De Castro E., Dolot, J., & Prenda, M., (2016). Barriers for educational technology integration in contemporary classroom environment. *Asia Pacific Journal of Education, Arts and Sciences, Barriers for Educational Technology Integration*. Vol. 3. No. 2, pp 13-20.
- Department of Education. (2010). DepEd Order 78, s. 2010. **Guidelines on the Implementation of the DepEd Computerization Program (DCP)**.
- Department of Education (2016). K-12 Curriculum Guide Edukasyong Pantahanan at Pangkabuhayan (EPP) and Technology and Livelihood Education (TLE) Grade 4 to 6.
- Engestrom (199). Activity theory on ICT. Retrieved on January 5, 2019. Retrieved from [https://link.springer.com/chapter/10.1007/978-94-6091-317-4\\_6](https://link.springer.com/chapter/10.1007/978-94-6091-317-4_6)
- Farahiza (2010). ICT education. Retrieved on August 20, 2018. Retrieved from [http://shodhganga.inflibnet.ac.in/bitstream/10603/27279/7/07\\_chapter%202.pdf](http://shodhganga.inflibnet.ac.in/bitstream/10603/27279/7/07_chapter%202.pdf)

Frederick and Kwame Ansong-Gyimah (2010). ICT education. Retrieved on September 6, 2018. Retrieved from [http://shodhganga.inflibnet.ac.in/bitstream/10603/27279/7/07\\_chapter%202.pdf](http://shodhganga.inflibnet.ac.in/bitstream/10603/27279/7/07_chapter%202.pdf)

Halili, Christian (2013). The status on the readiness on the use of computer technology as teaching aid in Makabayan-EPP instruction, SY 2011- 2012. Retrieved on September 16, 2018 Retrieved from [http://depedsanjosecity.net/?page=news&action=details&opt=popup&REF\\_ECODE=N\\_D13090001](http://depedsanjosecity.net/?page=news&action=details&opt=popup&REF_ECODE=N_D13090001)

Hennessy, S., Harrison, D., & Wamakote, L. (2010). Teacher factors influencing classroom use of ICT in sub-saharan africa. *Itupale Online Journal of African Studies*, vol 2, pp 39-54.

Higgins, S., Xiao Z. M., & Katsipataki, M., (2012). The impact of digital technology on learning: A summary for the education endowment foundation. Retrieved on July 13, 2018. Retrieved from [https://educationendowmentfoundation.org.uk/public/files/Publications/Theimpact\\_of\\_Digital\\_Technologies\\_on\\_Learning\\_\(2012\).pdf](https://educationendowmentfoundation.org.uk/public/files/Publications/Theimpact_of_Digital_Technologies_on_Learning_(2012).pdf)

Iwona and Ewa (2010). ICT education. Retrieved on August 21, 2018. Retrieved from [http://shodhganga.inflibnet.ac.in/bitstream/10603/27279/7/07\\_chapter\\_%202.pdf](http://shodhganga.inflibnet.ac.in/bitstream/10603/27279/7/07_chapter_%202.pdf)

Jaiswal, D. (2011). Role of ICT in teacher education. Retrieved on July 3, 2018. Retrieved from [https://pdfs.semanticscholar.org/6b4b/deb1c2dd1826e8\\_bedd637aa57032a2e492c9.pdf](https://pdfs.semanticscholar.org/6b4b/deb1c2dd1826e8_bedd637aa57032a2e492c9.pdf)

- Khan, M. S. H., Hasan, M., & Clement, C. K. (2012). Barriers to the introduction of ICT into education in developing countries: the example of Bangladesh. *International Journal of Instruction*, 5(2), 61–80.
- Kumar,V (2017). Importance of MS word in education. Retrieved on January 4, 2019. Retrieved from [www.klientsolutech.com](http://www.klientsolutech.com)
- Kumar,V. (2010). ICT education. Retrieved on August 21, 2018. Retrieved from [http://shodhganga.inflibnet.ac.in/bitstream/10603/27279/7/07\\_chapter%202.pdf](http://shodhganga.inflibnet.ac.in/bitstream/10603/27279/7/07_chapter%202.pdf)
- Latha, M. (2012) Attitude of higher secondary students towards internet. *International Mutidisciplinary E-Journal*. Vol.1, pp 20-26.
- Leoncio, C (2013). Importance of computer literacy to teachers. Retrieved on August 4, 2018. Retrieved from <http://deped-ne.net/?page=news&action=details&opt=popup&REFECODE=A113070005>
- Li, G., & Protacio, M. S. (2010). Best practices in professional development for teachers of ELLs. Retrieved on July 13, 2018. Retrieved from [https://www.researchgate.net/publication/256839551\\_Barriers\\_to\\_the\\_implementation\\_of\\_CALL\\_in\\_EFL\\_courses\\_Iranian\\_EFL\\_teachers'\\_attitudes\\_and\\_perspectives](https://www.researchgate.net/publication/256839551_Barriers_to_the_implementation_of_CALL_in_EFL_courses_Iranian_EFL_teachers'_attitudes_and_perspectives)

Lorenzo, A. & Lorenzo, B. (2013). Bridging the digital divide among public high school teachers: an adopt-a-school experience. Retrieved on July 3, 2018. Retrieved from <https://ac.els-cdn.com/S1877042813037713/1-s2.0-37713-main.pdf?tid=044c8dde-58de-471f-9373-58c52812943b&acdnat=1248fc74cd1b9a1f0e5f0876754c9e17>

Lynch, M. (2017). 25 Ways that EDTECH benefits teachers and students improve digital literacy. Retrieved on January 5, 2019. Retrieved from <https://www.theedadvocate.org/25-ways-that-edtech-benefits-teachers-and-students/>

Mariano, Jimson (2014). The use of computer technology for instruction among secondary school teachers of Alcala, Cagayan. Retrieved on September 20, 2018. Retrieved from [https://www.academia.edu/20339329/THESIS\\_on\\_the\\_use\\_of\\_computer\\_technology\\_in\\_secondary\\_schools](https://www.academia.edu/20339329/THESIS_on_the_use_of_computer_technology_in_secondary_schools)

Means, B. (2010). Technology and education change: focus on student learning. *Journal of Research on Technology in Education*, 42(3), 285–307.

Mercer, Edward (2019) How computers are used in education for elementary school. Retrieved on August 17, 2018. Retrieved from <https://itstillworks.com/computers-used-education-elementary-school-1304.html>

Neeraj, K., Anitha, M. (2010). Computer and internet awareness in school going students, Edutracks,. Retrieved on August 18, 2018. Retrieved from [http://shodhganga.inflibnet.ac.in/bitstream/10603/2797/07\\_chapter%202.pdf](http://shodhganga.inflibnet.ac.in/bitstream/10603/2797/07_chapter%202.pdf)

- Preeveena, Keyley (2011). Interactive Multimedia – A Technological Wave in Education. Retrieved on August 18, 2018. Retrieved from [http://shodhganga.inflibnet.ac.in/bitstream/10603/36053/8/08\\_chapter%202.pdf](http://shodhganga.inflibnet.ac.in/bitstream/10603/36053/8/08_chapter%202.pdf)
- Rachmawati and Johancynthia (2010). ICT education. Retrieved on August 21, 2018. Retrieved from [http://shodhganga.inflibnet.ac.in/bitstream/10603/27279/7/07\\_chapter%202.pdf](http://shodhganga.inflibnet.ac.in/bitstream/10603/27279/7/07_chapter%202.pdf)
- Rajakumar, Soureche and Viswanathan (2010). ICT education. Retrieved on August 21, 2018. Retrieved from [http://shodhganga.inflibnet.ac.in/bitstream/10603/27279/7/07\\_chapter%202.pdf](http://shodhganga.inflibnet.ac.in/bitstream/10603/27279/7/07_chapter%202.pdf)
- Reodique, Adrian M. (2017). How DepEd is digitalising Philippines' education sector. Retrieved on September 7, 2018. Retrieved from <https://www.computerworld.com.sg/print-article/110847/>
- Sharma, Vijay (2016). Importance of computer education in schools for students. Retrieved on September 19, 2019. Retrieved from <http://www.klientsolutech.com/importance-of-computer-education-in-ols-for-students/>
- Science Direct (2011). The use of internet for educational purposes. Retrieved on August 8, 2018. Retrieved from <https://www.sciencedirect.com/science/article/pii/S1877042811025547>

Soyouf, A., Sedighi, S., Sedighi, Z., & Talei, M. (2013). Beyond motivation: iranian teachers' perception of the role of computers. *International Journal of Information Technology and Computer Science*, 12(1), 68-73.

TOJET: The Turkish Online Journal of Educational Technology (2016) volume 15 issue 2. Retrieved on September 3, 2018. Retrieved from <http://www.tojet.net/articles/v15i2/1525.pdf>

Vijaykumar, Reen (2011) Technology: A catalyst of teaching learning process. Retrieved on August 18, 2018. Retrieved from [http://shodhganga.inflibnet.ac.in/bitstream/10603/36053/8/08\\_chapter%202.pdf](http://shodhganga.inflibnet.ac.in/bitstream/10603/36053/8/08_chapter%202.pdf)

Wiki Educator (2015). Role of computer education. Retrieved on September 10, 2018. Retrieved from [https://wikieducator.org/%5CRole\\_of\\_Computer\\_in\\_Education%5C](https://wikieducator.org/%5CRole_of_Computer_in_Education%5C)

Yilmaz, N. P. (2011). Evaluation of the technology integration. Retrieved on July 31, 2018. Retrieved from <http://www.cedtech.net/articles/21/213.pdf>

Yohannes, R. (2017). The importance of computer literacy in the age of technology. Retrieved September 10, 2018. Retrieved from <https://sahareducation.org/2017/05/computer-literacy-in-the-21st-century/>