Information and Communication Technology Needs of Teachers in District 8, City of Malolos: Basis for ICT Intervention Program

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Abstract: Information and Communication Technology (ICT) plays a significant role in the teaching-learning process because the learning becomes more interesting, active, and suited for the students of today who are considered digital natives, therefore, teachers should give high priority in developing their ICT competency as part of their professional development. The main objective of the study is to assess the ICT competency of teachers in District 8 in the Division of City of Malolos and formulate an ICT intervention program that will cater to their ICT competency needs. The respondents of the study were the 127 public school teachers from District 8 at the Division of City of Malolos. The survey instrument employed was from the National ICT Competency Standards for Teachers (NICS-Teachers) of the Commission of Information and Communication and Technology. In evaluating the ICT competency needs of teachers, a weighted mean was employed. It showed that the level of ICT competency of the respondents based on the aforementioned ICT standard for teachers was "Average," with an overall weighted mean of 3.37. This means that teachers can explain and discuss the tasks related to ICT but have not experienced the actual process. Considering the indicators with the lowest weighted mean, the researcher was able to formulate a proposed intervention program that will cater to the ICT competency needs of teachers in District 8. Grounded on the important conclusions and findings within the study, it is recommended that teachers should continuously develop their professional growth in terms of ICT competencies through attending training and seminars or learn through the use of different e-learning services. Furthermore, school heads must ensure the proper utilization and management of computers in their respective schools. Lastly, the researcher encourages other researchers to use the proposed ICT intervention program for teachers formulated in this study to verify its effectiveness.

Keywords—ICT competency; technology operations and concepts; pedagogy; professional

1. INTRODUCTION

Globalization and the Information and Communication Technology (ICT) revolution combined are rapidly raising the demand competencies and changing the nature of education and skills today. Students in this generation have undergone significant transformations. They are no longer the students our educational system was designed to educate. To meet their changing needs, new competencies are needed, and teachers cannot presume that the students are the same as they have always been, or that the same approaches that worked before will work for them today.

Teachers in today's classrooms must be equipped to provide students with technology-supported learning opportunities for their students. Being prepared to use technology and knowing how technology can support student learning has become an integral skill in every teacher's professional repertoire. Teachers need to be prepared to empower students with the advantages technology can bring (The United Nations Educational, Scientific and Cultural Organization, 2008) [1].

According to Andreas Scheicher, Organization for Economic Co-operation and Development (OECD) Director for Education and Skills, "Technology is the only way to dramatically expand access to knowledge. To deliver on the promises technology holds, countries need to invest more effectively and ensure that teachers are at the forefront of designing and implementing this change" (OECD, 2015) [2].

In developing nations like the Philippines, the government aims to improve the application of educational technology by different strategies and projects which ranged from the previous radio broadcast of education in the 1960s, educational televisions in the 1970s (edutainment), the Project CARES of DECS in 2001, up to the Department of Education (DepEd) computerization Program and the recent ICT4E Strategic Plan in 2010 [3]. These programs accepted educational technology as an efficient way to create precious opportunities for learning and collaboration thereby improving the teaching and learning process.

As cited by Singson (2014) in her study titled *Technology Acceptance Variables as Determinants of Behavioral Intention and Usage Behavior in Technology Among Public High School Students in Cavite*, educational technology holds many promises for education by transforming much of its perspective and practices. At the beginning of the 21st century, enormous changes occurred as a result of new information and technological developments. These changes are affecting

every segment of society and all levels of education. There are hundreds of ways in which technology can bring forth positive outcomes in education [4].

Furthermore, as stated by Prakash (2017) in her study about the *Effective Integration of ICT in Education: 21st Century Skills-Based Sustained Professional Development for Teachers*, technology and innovation have brought tremendous change in the way the students learn. With a global network, newer avenues, and resources of learning available, technology exposure and technology adoption amongst students are higher and learning is no longer confined to the classrooms. For the students to take effective advantage of technology, the teachers have to play a key role not just as imparters of knowledge but also as facilitators who will guide the students in using technology for their benefit [5].

According to Tolentino (2013) teachers are barely competent and they need a technology intervention program to upgrade their technological competence if they want to remain relevant in the increasingly digitalizing world of the academe. The teachers have the capacity and the willingness to absorb new technology infusion. More importantly, adequate training must be had to bridge the perceived gap between technology, pedagogy, and content to effectively transfer new knowledge to the students [6]. On the same note, Cabigao (2016) in his study on teachers' competence recommended developing a school-initiated program leading to a higher instructional competence among teachers [7].

It cannot be denied that with the full support of the Department of Education utilizing its ICT strategic plan, quality ICT will be achieved in the nick of time. Teachers should consider the fact that they are the captain of the ship, the success of transforming the students to become 21st-century learners is in their hands. With their efforts and the government's assistance, the country will develop lifelong learners who are prepared to compete in the rapidly changing age of technology.

2. Methods

The method used in the study was the descriptive method of educational research and it utilized the survey method. The survey was conducted at District 8, in the City Schools Division of Malolos. The respondents of the study are the 127 public school teachers at the aforementioned district. The researcher employed the census sampling technique because it considered the whole population as the respondents of the study.

The instrument used in the study was adapted from the standards of the National ICT Competency Standard (NICS) for teachers set by the Commission on Information and Communications Technology (CICT) in measuring the ICT competencies of teachers. It defines the competency outcomes and the supporting knowledge and skills that are needed to utilize ICT in performing the job roles related to teaching. It provides the performance indicators to evaluate the level of

knowledge and competence of teachers to apply ICT in educational settings [8]. In general, this set of competencies aims to prepare teachers to become users of various ICTs to help both the students and the teachers and benefit from technology. It is composed of four domains namely technology operation and concepts, social and ethical, pedagogical, and professional.

In observance of the professional ethics in conducting research, the researcher asked for official permission from the Schools Division Office through a letter of request. Upon the approval of the Schools Division Superintendent, the researcher immediately furnished a letter of endorsement addressed to all public school heads of District 8, City of Malolos for the conduct and administration of the survey questionnaire. The retrieval of the questionnaires was done after a week for the respondents to have enough time to answer the questionnaires. After retrieving all administered questionnaires, the responses were organized and processed for the appropriate statistical treatment.

Percentage, frequency, mean, and weighted mean were utilized by the researcher to facilitate analysis and interpretation of the gathered data. Hence, the meaning was derived from numerical values.
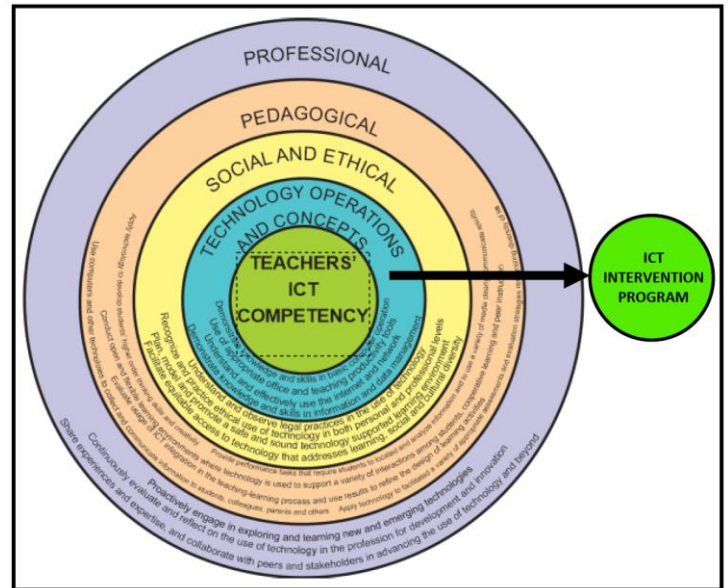

Fig. 1. *Conceptual Model of the Study*

3. RESULTS

The findings of the study show that 96 of the respondents or 75.59% of the total respondents came from the age group 30 – 50 years old, while 26 or 20.47% of the respondents came from the age group under 30 years old, and the remaining 5 or 3.94% of the respondents came from the age group 51 years old and above. On the other hand, the majority (111 or

87.40%) of the respondents were female and the rest of the respondents, or 16 or 12.60% were males. Moreover, the study reveals that the majority or 104 or 81.89% of the respondents were bachelor degree holders while the rest or the 23 or 18.11% are with master's degree. Furthermore, 99 or 77.95% of the respondents have been in service for 10 years and below, while 17 or 13.39% of them have been in service for 11 to 20 years, the rest or 11 or 8.66% have been teaching for 21 years, and above. In addition, 87 or 68.50% of the respondents were married while 40 or 31.50% of them were single. The study also shows that most of the ICT activities attended by the respondents were ICT seminars while online learning came second, third was ICT training, and least attended was National Certificate (NCII). In terms of the hardware owned and used by the respondents, out of 127 respondents, 115 owned and used a laptop, while the least owned and used hardware of the respondents was tablet or iPad. In terms of the software used by the respondents, the study shows that Microsoft Office applications were the commonly used software by the respondents while the least used was E-learning Services. Lastly, in terms of internet access, the study revealed that the number one internet access of the respondents was at home while the least of which have internet access in school.

Based on the results of the study, Table 1 showed the level of ICT competencies of the respondents using the National ICT Competency Standard for Teachers.

Table 1: *Level of ICT Competency of the Respondents Based on the National ICT Competency Standard for Teachers*

Domain	Weighted Mean	Verbal Interpretation
Technology operations and concepts	3.52	High
Social and Ethical	3.50	High
Pedagogy	3.28	Average
Professional	3.16	Average
Overall Weighted Mean	**3.37**	**Average**

According to Marcial (2015), it is recommended to conduct a thorough training program on ICT skills enhancement for teachers. There should be a prudent change in terms of the duration of training to avoid information overload among the trainees [9].

Moreover, the conclusion and recommendation of the study of Caluza (2015) titled An Assessment of ICT Competencies of Public School Teachers: Basis for Community Extension Program revealed that teachers have basic knowledge in ICT. However, this is not enough to say that teachers are already competent in ICT. Teachers need to be proficient in knowing where and when to use technology for teaching other related tasks. Teachers' professional development is a key factor for the successful integration of computers in classroom teaching. It is then recommended that teachers undergo training that will help further enhance their computer skills and knowledge [10].

4. CONCLUSION

It is concluded that the majority of the teacher-respondents are female, 30 – 50 years old, all with bachelor's degrees, and with 10 years and below of teaching experience and with married marital status. The respondents ranked ICT seminar as their top ICT activity attended, laptop as their mostly owned and used ICT hardware, Microsoft Office as their primary used software, and the majority of them have internet access at home.

The level of ICT competency of the respondents in terms of technology operations and concepts and social and ethical domains was High which means that the teachers can perform and carry out the tasks but need help, advice, and guidance from an expert. On the other hand, in terms of Pedagogy and Professional domains, the level of ICT competency of the respondents was Average which means that they did not experience the actual process of different technological tasks. The overall ICT competency of teachers in District 8 of the City of Malolos based on the NICS for teachers was Average which means that they can explain and discuss the tasks but have not experienced the actual process.

Based on the results of the study, the researcher was able to identify specific areas where teachers seem to have low ICT competency levels, thus an ICT intervention program was formulated to cater to the ICT competency needs of teachers in District 8, City of Malolos.

5. RECOMMENDATIONS

Teachers should continuously develop their professional growth in terms of ICT competencies through attending training and seminars or learn through the use of different e-learning services available on the World Wide Web.

Also, teachers can create a professional development opportunity that promotes teacher collaboration through connecting in online communities for education wherein teachers can work together with their colleagues all over the world as well as learn other academic approaches using information communication technology. This will assist the teachers to learn more about new emerging technologies.

Moreover, the Department of Education should invest in high-quality ICT teacher educators; they can recruit professional ICT development providers with extensive teaching experience to facilitate different pieces of training and seminars to develop the ICT skills of teachers.

Furthermore, school heads must ensure the proper utilization and management of computers in their respective schools. They must monitor and evaluate the extent of benefits of technology if integrated into the teaching-learning process. Aside from the school administrators as the leading initiator of encouraging the teachers to develop their ICT competencies, the school ICT coordinators should also motivate their peers to consistently attend ICT training through proper coordination with the division information and technology officer.

The Department of Education must establish a partnership with private institutions or agencies which can provide different pieces of training, workshops, and available technological resources to further enhance the ICT competency of teachers.

Lastly, the researcher encourages other researchers to use the proposed ICT intervention program for teachers formulated in this study for verifying its effectiveness.

6. ACKNOWLEDGMENT

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Appendix A

Proposed ICT Intervention Program for Teachers in District 8, City of Malolos

Areas	Competencies	Objectives	Strategies/Activities	Resources		Duration	Success Indicators
				Material	**Human**		
Technology Operations and Concepts	• Configure computer settings of various software and hardware. • Connect to the internet via dial-up or LAN.	Perform appropriate steps to set-up a basic workstation including internet connection.	Workshops on how to install an operating system, install and uninstall software, configure computer peripherals and configure and verify internet connection.	• Personal Computer • Projector • Internet Connection	• Computer Technician	40 hours	• Perform basic troubleshooting whenever there are problems with their computers.
	• Stitch together video footages and sound tracks and add simple enhancements - transitions, titles, etc.	Create and edit video presentation.	Tutorials on how to create video presentations using Cyberlink Power Director.	• Personal Computer • Projector • Cyberlink Power Director	• Video Editor • ICT Coordinator	8hours	• Create customized video presentation which they can use in presenting their lessons.
	• Effectively use search engines, directories, crawlers and agents to locate information sources • Efficiently store and organize collected information using directories, drives, or databases	Develop the knowledge and skills in information and data management of teachers.	Peer tutoring on the use of different search engines and cloud based storage.	• Personal Computer • Internet Connection	• ICT Coordinator • ICT Teachers	16 hours	• Find relevant information and resources online that will help them widen the mastery of the subjects they teach.
Social and Ethical	• Differentiate and identify the copyright, trademark, patent of various products • Detect plagiarism in student work	To be familiarized with the legal practices in the use of technology.	Symposium about the legal practices in the use of technology.	• Personal Computer • Projector	Division Legal Officer	8 hours	• Avoid illegal practices regarding the use of technology.
	• Accurately report malfunctions and problems with computer software and hardware • Help minimize the effects of the digital divide by providing access to digital materials for all students.	Identify hazards and risks in using ICT equipments.	Training on occupational hazards and risks in using ICT equipments.	• Personal Computer Projector	Computer Technician	8 hours	• Mitigate the effects of untoward incidents regarding computer malfunctions.
Pedagogy	• Use electronic means of administering quizzes and examinations. • Use emails, group sites, blogs, etc. to collect information and feedback directly from students, colleagues and parents. • Set up online databases or repositories of student works	Apply variety of appropriate assessments and evaluation strategies in teaching.	SLAC sessions on the use of different EdTEch (Educational Technology) Tools like Plickers, Quizziz, etc.	• Personal Computer • Internet Connection Projector • EdTEch Tools	• ICT Coordinator	25 hours	• Increase students' engagement and achievement in the learning process.

Areas	Competencies	Objectives	Strategies/Activities	Resources		Duration	Success Indicators
				Material	**Human**		
	• Make students use databases, spread sheets, concept mapping tools and communication tools. • Teach students to use various multimedia materials for the reports and class presentations. • Use various synchronous and asynchronous communication tools (email, chat, white boards, forum, and blogs).	To enhance the skills of teachers in utilizing ICT in teaching-learning process.	Benchmarking about the best practices of schools within District 8 in terms of pedagogical utilization of ICT.	• Computer Laboratory • ICT best practices	• Schools with ICT Best Practices	Every quarter	• Increase students' engagement and achievement in the learning process.
Professional	• Review new and existing software for education.	Share experiences and expertise, of teachers with their peers and stakeholders using technology.	• Video presentation about new and existing software for education. • Hands-on training on the use of social media applications	• Personal Computer • Internet Connection • Projector	ICT Coordinator	4 hours	• Promote collaborative environment for easy access of information and sharing of experiences.
	• Conduct research on the use of technology in the classroom. • Publish (formal /informal) research on the use of ICT in education.	Develop researches that will improve the effectiveness of using technology in the learning process.	ICT Research Write shop	• Personal Computer • Internet Connection Projector	• Researcher • District Supervisor	40 hours	• Craft action researches that will improve the effectiveness of ICT integration in education.