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ICT Competencies among Public Secondary School MAPEH Teachers: An Assessment

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ABSTRACT

The impact of Information and Communication Technology (ICT) has been felt in the educational school setting locally and internationally. It plays a vital role both in teaching and learning. This study aimed to assess the ICT competencies among MAPEH teachers of selected Public Secondary Schools in District IV of Nueva Ecija. Specifically, it aimed to (1) determine the profile of the MAPEH teachers; and (2) assess their level of ICT competencies in terms of technology operations and concepts and pedagogical skill. The researchers used the descriptive research method, specifically questionnaires, as the primary tool for data gathering. Thirty Four (34) MAPEH teachers served as respondents. Frequency, percentage, and the weighted mean were used in this study. Results showed that respondents assessed their ICT competencies as "advanced" in terms of technology operations and concepts, and evaluated their pedagogical competence as "basic." Respondents have basic knowledge of ICT. Conversely,

this is not enough to say that MAPEH teachers are already competent and skilled in ICT. Teachers'professional development is a critical factor in the successful integration of computers in teaching. It is recommended that administrators must allocate budget for ICT, most notably on the technological resources, and teachers shall undergo seminars and trainings that will help further enhance and improve their computer skills and knowledge.

Keywords **—** Information and Communication Technology, Competency, Technology Operations, Descriptive, Philippines

INTRODUCTION

From a developing and emerging world standpoint, two of the most powerful and influential forces of the 21st Century are the globalization of the economy and the growth of Information and Communication Technologies (ICT) (Briones, 2018). Research studies in the educational setting have revealed that information and communication technologies (ICT) combined with essential pedagogical schemes and strategies engage students in higher-order thinking (Lim, 2007). ICT has become vital in our field of work, learning, and personal lives (Johansen et al., 2017). Nowadays, technological development is a part of the educational process. Individuals are logically skilled and exceptional to come up with the latest and innovative applications, software, and devices used in several fields (Shade, 2012)new ways of citizens' empowerment and active participation in their societies at both social and political levels. This article aims at briefing the roles of ICT in significant areas of human development such as health, education and citizen empowerment, taking into consideration the unequally distribution of ICT infrastructure (the digital divide (Lubis, 2011).

In the field of education, there are various applications used to assist and facilitate the operation and process of the school system. Studies revealed that the use of ICT has a significant contribution in the teaching and learning process (Bozdogan, & Özen, 2014) which includes, active students' learning (Tripathi, 2017); enrichment of learners' achievement (Blackmore et al. 2013); more access to data and information; enhancing students' literacy skills (Ammanni, 2016); making teachers take a fresh look at the way they teach; and teachers focus more on student learning (Ilomäki, 2008). These contributions in the educational process provide the means to assess further and develop the use of technology in the teaching process.

Today, students are growing up and evolving in a world characterized by technological transformation, innovation, and improvement. Educationalist has recognized that there is a necessity to equip learners with the necessary experiences and skills that will allow them to become contributing members of the global environment. Hence, it is generally believed that Information and Communication Technology can empower learners and teachers, promote change, and foster the development of 21st-century skills, but data to validate and support these beliefs are still inadequate. Alternatively, ICT is also believed to be able to give and contribute to the empowerment of learning in the society since these tools can play a vital role in reforming educational systems, increasing access to pedagogical means and resources, enhancing the management of education and improving educational techniques (Kuyoro et al., 2012)new ways of citizens' empowerment and active participation in their societies at both social and political levels. This article aims at briefing the roles of ICT in significant areas of human development such as health, education and citizen empowerment, taking into consideration the unequally distribution of ICT infrastructure (the digital divide.

Indeed, ICT has the power to increase inspiration, motivation, and student engagement and support to improve life-long learning skills. As a powerful scholastic tool, ICT can facilitate and enable the transformation of school education. But to make this possible, it is vital to bring changes to the mindset, environment, and culture among teachers, administrators, students, and parents; how the curriculum is planned, developed, and delivered; and how students are currently assessed and evaluated. Therefore, linking ICT continues to be a significant challenge to educators due to some reasons like the ratio of student-computer and teacher-computer, lack of training about ICT, lack of confidence and competence in ICT, lack of technical support, and accessibility to ICT resources.

The Philippine Government presented a solemn obligation to ICT in education by stating a series of advantages to apply ICT in the teaching and learning process. These were associated with the Education for All movements and Millennium Development Goals. They have provided a global and international policy environment for the directions and nature of involvement and interventions towards the achievement of improved access and quality of primary education. Other key program documents have acknowledged the need for ICT improvement within the educational sector, and these have resulted in more prioritizing from teachers and schools and regarding the integration of ICT

into the educational system (Caluza et al., 2017). The public schools in Nueva Ecija are trying its best to address and providing different solutions in relation to this challenge, the use of ICT in the provision and delivery of its educational system, thereby providing the essential skills and knowledge of its teachers. Thus, in response to the new challenge of the 21st Century Education and K12 curriculum of improving the quality of education and integrating technology into teaching and learning, this research study was an attempt to assess the current level of competencies of secondary public school teachers. Also, needs assessment for teachers will be conducted to measure the level of ICT competencies in order to design and provide an ICT program suitable according to their needs.

FRAMEWORK

Information and communication technologies (ICT) have developed and established to be one of the central building blocks of society(Suliman et al. 2017). Many countries considered the application of the essential abilities and ideas of ICT as an inevitable part of education.

At present, different new models of training in education are evolving because of the new opportunities brought about by the integration of ICT and other technologies into the learning environment. The successful combination of such applications depends on a massive degree in the instructor's harmony and capability with the IT learning environment.

This research study adopted the theoretical underpinning of the National ICT Competency Standard Framework (NICS) for teachers developed by the National Computer Center or NCC in the Philippines. The Competency Standard Framework of ICT for teachers outlines the competency outcomes and the supporting skills and knowledge that are necessary to apply ICT in the job roles about teaching in the Philippine setting. It also provides the performance indicators to assess the level of expertise and competence of teachers to apply ICT in the educational environment. The domains that are included within the framework of NICS are A) Technology Operations and Concepts Competency Descriptors, this field requires expertise to show knowledge and skills in critical computer activity and other data tools, including basic computer troubleshooting and maintenance. This includes the proficiency and skills in different productivity applications such as Word processing, Spreadsheets, Presentations, and Antivirus software. It also focuses on the use of Internet applications to search, locate, and retrieve information resources to support the learning environment; and (B)

Pedagogical Competency descriptor, this domain includes competencies related to the use of technology in the following components of an instruction process: a) planning and designing productive learning environments and experiences supported by technology; b)implementing, facilitating and monitoring teaching and learning strategies, and techniques that integrate a range of information and communication technologies to promote and enhance student learning; and c) assessing and evaluating student learning and performances. Apply and evaluate the usage of ICT integration in the teaching-learning process and use results to refine the design of education.

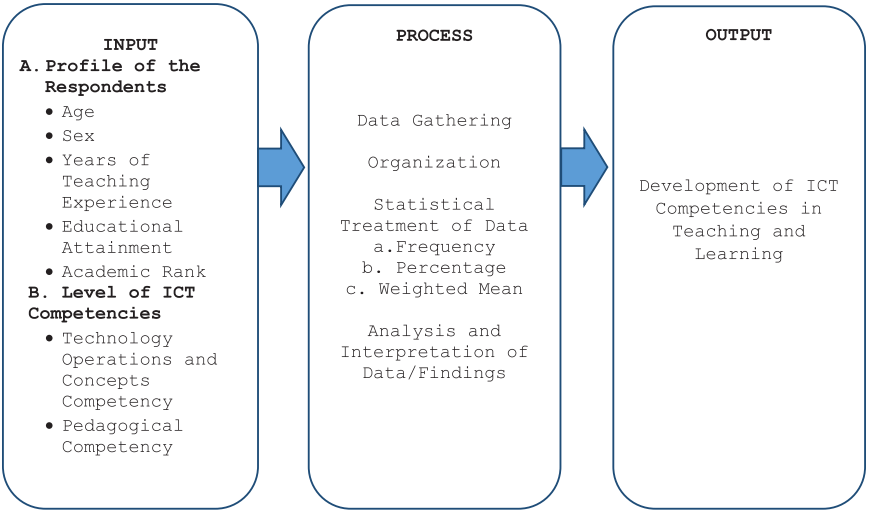

Figure 1. Research Framework

The framework presented above depicts the relationship between the input, process, and output of the study. The input of the study includes the profile of the teacher-respondents and their level of ICT competencies, such as the technology operations and concepts competency and pedagogical competency. The process consists of the data gathering procedure, organization of data, statistical analysis, and interpretation of data and findings. Furthermore, this study will serve as a basis for the Development of ICT competencies intended for both teaching and learning.

OBJECTIVES OF THE STUDY

This research study aimed to assess the ICT competencies of Music, Arts, Physical Education and Health (MAPEH) teachers of selected Public Secondary School in the District IV of Nueva Ecija. Specifically, it aimed to (1) determine the profile of the MAPEH teachers; and (2) assess the level of ICT competencies in terms of technology operations and concepts, and pedagogical competency.

METHODOLOGY

Research Design

This research study utilized a descriptive research design to analyze data through the quantitative method and devoted to the collecting of information about prevailing conditions for descriptions and interpretation (Dorfman et al. 2017).

Research Site

The research was conducted in the selected public secondary schools in district IV of Nueva Ecija, namely Cabiao National High School, T.A. Dionisio National High School, San Nicolas High School, Calaba National High School, and Jaen National High School. The schools were chosen based on the convenience of the researchers using the purposive sampling method; this sampling method is the most effective when one needs to study a certain cultural domain with knowledgeable experts within(Bloor & Wood, 2016). The respondents of this study were all 34 MAPEH teachers of the five secondary public schools.

Respondents

To accomplish the objectives of the study, the representative samples were selected using the total enumeration. The respondents of this study were all 34 MAPEH teachers of the five public secondary schools.

Instrumentation

The instrument used was adopted from the National ICT Competency Standard Framework (NICS) to assess the level of competency of the secondary MAPEH teachers. The tool comprised of two parts, the first part dealt with the profile of the respondents, and the second part of the instrument dealt with the level of ICT competencies in terms of technology operations and concepts

skill, and pedagogical competency. The items were rated using the competency proficiency scale (Russo, 2016) as follows: 5-Expert; 4-Advanced; 3-Proficient; 2 -Basic; and 1—Limited.

Ethics Protocol

The study used informed consent from the respondents and applied the confidentiality of the information. There were letters of permission personally handed to the principals of the different secondary public schools in the gathering of data. Respondents' consent involved in the research was considered accurate.

Validity and Reliability

The survey-questionnaire was subjected to pilot testing by five MAPEH teachers having the same characteristics as the target respondents for the study.

The analysis of the reliability on the level of ICT competencies (technology operations and concepts competency, and pedagogical competence), based on the full-scale study was conducted. Table 1 below shows the summarized results of the reliability analysis.

Table 1. Results of Reliability Analysis

Variables	Number of Items	Cronbach's Alpha
A. Technology Operations and Concepts Competency	37	.795
B. Pedagogical Competency	13	.850

Cronbach's alpha reliability coefficient for Technology Operations and Concepts Competency, with 37 items, is 0.795. The Cronbach's alpha for Pedagogical Competency, with 13 items, is 0.850. = Reliabilities that is less than 0.60 were considered to be weak, those in the 0.7 range were deemed acceptable, and those over 0.8 were considered good. Hence, reliability testing will test the appropriateness of our questionnaire in this study. Besides, this reliability test will use Cronbach's alpha testing, which is a famous test of inter-item consistency by social researches (Sekaran, 2010), as mentioned by Samonte & De Guzman (2017, 2018). The Cronbach's Alpha of this research study ranged from 0.795 to 0.850, all of which were well above 0.600. Hence, all items of measurement for this study can be considered as acceptable to provide us with consistent and reliable results.

Data Collection

The researchers identified the research respondents. The total population was 34 MAPEH teachers. The researchers submitted a request communication letter to the school principal then presented a letter seeking permission to conduct the study. Having been granted consent, the researchers conducted the assessment instrument. The retrieval of the survey tool took one week after its distribution.

Statistical Techniques

The data were analyzed using the descriptive method of statistics like Percentage, Frequency, and Mean. Percentage and frequency were used to describe the profile of the respondents. Mean was used to determine the mean weight of responses of the MAPEH teacher-respondents on the level of ICT competencies.

RESULTS AND DISCUSSION

Table 2. Demographic profile of the MAPEH Teachers of selected Secondary Public Schools in the District IV of Nueva Ecija

CHARACTERISTICS	FREQUENCY	PERCENTAGE
Age		
20 – 25 years old	4	11.8
26 – 30 years old	6	17.6
31 – 35 years old	3	8.8
35 years old and above	21	61.8
Gender		
Male	10	29.4
Female	24	70.6
Civil Status		
Single	14	41.2
Married	19	55.9
Widow/er	1	2.9
Years of Experience		
5 – 10 years	13	38.2
10 – 15 years	6	17.6
15 years and above	15	44.1

Academic Rank		
Teacher I	12	35.3
Teacher II	4	11.8
Teacher III	17	50.0
Master Teacher I	1	2.9
Highest Level of Educational Attainment		
Bachelor's Degree	7	20.6
With Masteral Unit	22	64.7
Master's Degree	5	14.7

Level of ICT Competencies in terms of Technology Operations and Concepts

The table presents the results of ICT competencies in terms of technology operations and concepts. It shows that the grand weighted mean of domain A was 3.78, with a verbal interpretation of "advanced." It implies that most of the respondents have basic knowledge in demonstrating knowledge and skills in essential computer operation and other information devices. The respondents are advanced in this standard. However, concerns about the lack of digital access have given way to worries about being digitally illiterate', i.e., lacking the skills, understandings, and practices required to successfully navigate the ever-changing digital landscape (Yildirim, 2007). It is, therefore, important that educators should have access to computers, the internet, hardware, and software to increase their knowledge of ICT. Also, respondents have advanced knowledge on the use of teaching productivity tools in terms of presentation packages to add text and sequence a presentation. Research has shown that teachers require an expert in technology to show them the way to integrate ICT to facilitate students' learning (Plair, 2008). Studies revealed that respondents were experts in understanding and in the effective use of the internet and network applications and resources. Teo, 2008) pointed out that using computers more frequently and developing a variety of computer-related skills and techniques increases one's knowledge of the network as a whole. The data revealed that standard 4, demonstrate knowledge and skills in information and data management got an average weighted mean of 2.94; the respondents were proficient based on the results. Gathering sources for research is now relatively easy because of the Internet, but through this, students are more likely to commit internet plagiarism (Mcgabe, 2011). This literature supports on why teachers should know the proper way of doing citations both for online and offline sources to be able to guide their students on the appropriate method of gathering information.

Table 3. ICT competencies in terms of Technology Operations and Concepts

Indicators	*Mean*	*Verbal Interpretation*
Standard 1. Demonstrate knowledge and skills in essential computer operation and Other information devices, including basic troubleshooting and maintenance	3.65	Advanced
Standard 2. Use Appropriate office and teaching productivity tools	4.18	Advanced
Standard 3. Understand and effectively use of the Internet and network applications and resources	4.34	Expert
Standard 4. Demonstrate knowledge and skills in the information and data management	2.94	Proficient
Grand Weighted Mean	3.78	Advanced

Level of ICT Competencies in terms of Pedagogical Competency

The table presents the results of ICT competencies in terms of pedagogical competence. It shows that the grand weighted mean of domain B was 2.20 with a verbal interpretation of "basic." Respondents had limited knowledge and competencies in applying technology to develop students' higher-order thinking skills and creativity and to facilitate a variety of appropriate assessment and evaluation strategies recognizing the diversity of learners. This can be credited and attributed to the following factors: availability and quality of computers for the student to use and teacher's access to ICT resources. Dixon et al. (2005) listed 20 necessary skills that all educators should have, one of which is the Database skills to create an appropriate assessment and evaluation techniques. Also, the study of Nigerian in-service teachers recommended that all in-service teachers should have minimum proficiency in the use of a variety of software, including necessary word processing, database, and spreadsheet functions.

Furthermore, teachers assessed their competency in standards 2 and 3 as limited, most notably in providing performance tasks that enable students to locate and analyze information and use a variety of media to communicate results. Meanwhile, standard 4 in pedagogical competence of teachers revealed that their level of competencies was advanced in terms of designing rubrics, the use of electronic to administer quizzes and examinations and analyze assessment data. Teachers also evaluated their skills in using computers and other technologies to collect and communicate information to students, colleagues, parents, and others as proficient. Furthermore, it is essential not only to think of the access teachers

need to teach with ICT, but also to consider the need for teachers to have their access to ICT, to allow them to plan and prepare lessons (Caluza et al., 2017)

Table 4. ICT competencies in terms of Pedagogical Competency

Indicators	Mean	Verbal Interpretation
Standard 1. Apply technology to develop students' higher-order thinking skills and creativity	1.78	Limited
Standard 2. Provide performance tasks that require students to locate and analyze information and use a variety of media to communicate results	1.73	Limited
Standard 3. Conduct open and flexible learning environments where technology is used to support a variety of interactions among students, cooperative learning, and peer instruction	1.25	Limited
Standard 4. Evaluate the usage of ICT integration in the teaching-learning process and use the results to refine the design of learning activities	3.84	Advanced
Standard 5. Use computers and other technologies to collect and communicate information to students, colleagues, parents, and others	3.25	Proficient
Standard 6. Apply technology to facilitate a variety of appropriate assessment and evaluation strategies recognizing the diversity of learners	1.34	Limited
Grand Weighted Mean	2.20	Basic

CONCLUSION

The results of the research study revealed that MAPEH teachers have a basic knowledge of ICT. However, this is not enough to say that teachers are already competent and skilled in ICT. Teachers need to be proficient in knowing where and when to use technology for teaching, learning, and other related tasks. It is recommended that teachers undergo training and seminars that will help further enhance and enrich their computer skills and knowledge.

TRANSLATIONAL RESEARCH

The result of the study could be translated into an ICT competency program report enhancement and development to the Principals and Division Heads for information distribution and to consider the integration of the findings in formulating programs related to ICT. Additionally, Division Office might be able to translate it into a more wide-ranging, organized plan and strategy on ICT development, enhancement, and improvement of skills and knowledge among teachers and students.

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