ICT Competency Level of Teacher Education Professionals in the Central Visayas Region, Philippines

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Abstract *–Information and communication technology (ICT) plays a vital role in teaching and learning. This paper presents the landscape of ICT competency of faculty in the teacher education institutions in the central region of the Philippines. Specifically, the study investigates the ICT competency level in institutions of higher learning offering teacher education programs in the four provinces in Central Visayas, Philippines. A total of 383 survey responses was analyzed in the study. Respondents are all faculty handling any professional and/or specialization courses in the teacher education. The ICT competency level is measured empirically in terms of work aspects described in the UNESCO's ICT Competency Standards for Teachers. The instrument used in data gathering was a survey questionnaire.This study reveals that the ICT competency level of the respondents is in the knowledge deepening level. The result implies that the teacher educators are integrative, student-centered and collaborative using the necessary tools. It is concluded that there is a slight technology infusion into the teaching instruction among teacher educators in Region 7. There is a need to improve the level of competency among the teacher educators, particularly skills in using complex and pervasive ICT tools to achieve innovative teaching and learning.*

Keywords *–ICT in Education, ICT Competency Standards, Teacher Education*

INTRODUCTION

Information and communication technology (ICT) refers to information-handling tools used to generate, store, process, spread and share information [1]. The use of ICT in education is clearly not a new rally for the protection and promotion of life. There are many pieces of evidence that the use of ICT in education provides useful pedagogical, social and economic benefits [2]. According to Shyamal Majumdar, director general of the Colombo Plan Staff College for Technician Education [citedin 3], ICT in education has at least four stages.The first stage is emerging phase that means awareness. Second, applying stage that means learning. Third is infusing stage that involves the use and integration into the curriculum. The last stage is transforming phase that means innovative learning by developing new ways of teaching-learning using ICT.

In developed countries, ICT in education is undeniably having produced significant positive impact. ICT is changing the developed world's attitudes and approaches to education" [4]. Education in these countries becomes more flexible, accommodating and increases therange of potential learners. E-learning, blended learning, open and distance learning, learner-centered environment, and mobile learning are just a few significant changes in these countries. ICTdoes not only change the way the teachers teach, but the way the students learn as well. In contrast, ICT integration in the developing countries has been a long way to go and ICT infusion in education is an emerging issue. On the positive side, government, non-government organizations, industries and other stakeholders have jointly worked together to promote ICT for the advancement and betterment of life of every citizen. The article [5] reported that the education sector garnered 20% of Asia's top IT-using institution. Open universities, e-learning programs, mobile learning and computing, among others, are also embraced by the developing countries.

In the Philippines, the government aimed to become an e-service hub, and the IT service sector has been growing rapidly. Initiative for innovative teaching and learning and growing an ICT-enabled education started more than a decade ago. In 1997, a National

Information Technology Action Agenda for the 21stcentury, also known as IT 21, was formulated to formalize the country's vision to be globally competitive through information technology [6]. At present, the Philippines' Digital Strategy (PDS) was formulated strategically to make the country a "digitally empowered, innovative, globally competitive, and prosperous society where everyone has established, affordable and secure information access in the Philippines". Among the many specific objectives, the PDS aims to use ICT in education and training as a means to provide equitable access to opportunities. As a result, empowered and enriched lives of every Filipino can be attained.

This study responded two priority discipline clusters of the second National Higher Education Research Agenda (NHERA-II) of the Philippines Commission on Higher Education, namely: Education and Teacher Training (ETT), and Information and Communication Technology (ICT). This study is motivated by the fact that ICT is an enabler of development in education [1], a potential means of reducing poverty [7], stimulates sustainable economic growth [8], and can address the challenges faced in the teacher education [9]. Likewise, this study is motivated by the fact that CHED defines teacher education as a key factor in quality Philippine education. In the revised policies and standards for undergraduate teacher education curriculum, CMO 30, Series of 2004, Section 1 states that

Quality pre-service teacher education is a key factor in quality Philippine education. In the Philippines, the pre-service preparation of teachers for the primary and secondary educational sectors is a very important function and responsibility that has been assigned to higher education institutions. All efforts to improve the quality of education in the Philippines are dependent on the service of teachers who are properly prepared to undertake the various important roles and functions of teachers.

While it is true that, ICT can support changes in pedagogy and improves in teaching-learning, providing computers in the classroom does not improve outcomes. It should be well-planned. An education policy for ICT in education should be the primary policy in any institution [10]. The absence of these complementary reforms may result to slow infusion of ICT in education. Inadequate government funding, affordability, lack of infrastructure, and scarce skilled human resources are among the many reasons for the diffusion of ICT in education [4].

This paper is part of a larger research on ICT competency in the teacher education program in Central Visayas, Philippines. Specifically, this paper presents the ICT competency level in higher education institutions offering teacher education programs in four provinces in Central Visayas, Philippines, namely: Bohol, Cebu, Negros Oriental and Siquijor. It also shows the relationships between the respondent's demographic profile such as sex, age, status, type of institution, number of years in teaching, and highest educational attainment. This profile are helpful in the analysis and interpretation of data most especially in the formulation of the training program as well as in the development of the proposed digital teaching applications. This article also shows the relationships between the respondent's technology ownership of a desktop, Smartphone, tablet, laptop, and Internet accessibility. Competencies used in this study are limited only to the teacher's work aspects as classified in the UNESCO's ICT Competency Standards for Teachers (ICT-CST). Moreover,teacher education program refers to degree programs such as Bachelor of Science in Secondary Education and Bachelor of Science in Elementary Education offered in public and private HEIs within the said region.

OBJECTIVES OF THE STUDY

The study is aimed at answering the following research questions:

1. What is the level of ICT competency of the respondents according to the following teacher's work aspects: policy, curriculum and assessment, pedagogy, tools, organization and administration, and teacher professional learning?
2. What is the relationship between ICT competency level and the respondent's demographic profile such as sex, age, status, type of institution, number of years in teaching, and highest educational attainment?
3. What is the relationship between ICT competency level and the respondent's technology ownership of a desktop, Smartphone, tablet, laptop, and Internet accessibility?
4. Is there a difference of the level of ICT competency among the groups of respondents?

REVIEW OF RELATED LITERATURE

ICT has become one of the various themes and priorities in the international communities. UNDP considers ICT as anenabler of progress in education [1]. Likewise, the Asian Development Bank (ADB) reported that modern ICT has the potential in reducing poverty in Asia and the Pacific [7]. ADB's ICT initiatives in education highlight projects inimproving skills training in poor rural areas. Specifically, it includes ICT components like assessment, training, e-learning

systems development, among others [7]. Similarly, the World Bank promotes access and use of ICT to stimulate sustainable economic growth, improve service delivery, and promote good governance and social accountability. Word Bank's program on ICT focuses on three pillars: infrastructure, skills development, and the use of ICT applications, inparticular, sectors, and context like education [8]. Also, UNESCO believes that ICT can addressthe challenges faced in the teacher educationinstitutions[9]. UNESCO has initiatives related to the use of ICT in the teacher education institutions by supporting existing teacher development communities of practice, multi-stakeholder partnerships, capacity building of policy-makers and the development of international standardsforICT competencies for teachers.

UNESCO's ICT Competency Standards for Teachers (ICT-CST) overall goal is to improve teacher practice. It aims to achieve it in a way that contributes to a higher quality education system for a better-informed citizenry and higher quality workforce. As a result, it advances the country's economic and social development. The intent of the UNESCO ICT-CST project is "to connect education reform to economic growth and social development that can improve the quality of teaching, reduce poverty and inequity, advance the standards of living, and prepare a country's citizens for the challenges of the 21st century" [11]. UNESCO's framework emphasizes that acquiring ICT skills and be able to teach them to students is not enough for teachers. Teachers need to be able to mold students become collaborative, problem-solving, creative learners through using ICT so they will becapable citizens and productive members of the workforce. The framework addresses all aspects of a teacher's work such as understanding thepolicy, curriculum and assessment, pedagogy, ICT, organization and administration, and teacher professional learning [9, 11]. As shown in figure 1, it is arranged in three different approaches to teaching: technology literacy, knowledge deepening, and knowledge creation. The first teaching approach aimed to let students use ICT to learn more efficiently. The second teaching approach enables students to acquire an in-depth understanding of their school subjects and use it for complicated and real-world problems. The third teaching approach allows studentsto create the new knowledge required for more harmonious, fulfilling and prosperous societies.

The use of ICT in education is a unique opportunity for teachers. It provides significant benefits to the teachers as well as learners and other stakeholders. These advantages include theprovision of a qualitative access to education [12]. It also offers cost reduction, self-paced training, knowledge consistency, time and place independence, and access to a global audience [13]. It promotes valid sustainable strategy [14]. Further, it promotes changes in attitudes, behavior and values, as well as in the cognitive and perceptiveprocesses [15]. In contrary, among the obstacles that teachers experience in integrating ICT in the teaching and learning are lacking knowledge, outdated equipment, lack of time and lack of technical competency [16].

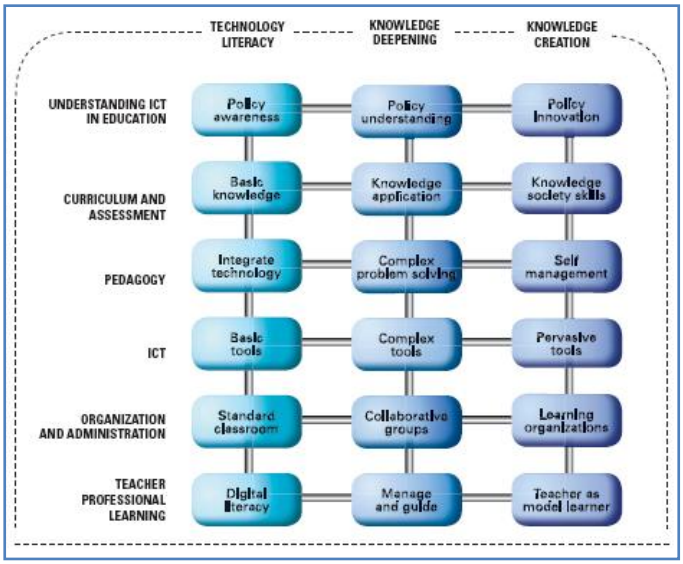

Figure 1. Framework of the UNESCO's ICT Competency Standards for Teachers (image is captured from [11, p. 9]

The study [17] quantified the digital divide that existed between schools in Metro Manila and schools in other countries. Although Rodrigo's analysis focuses on students, her conclusion provides an idea of how Metro Manila schools are challenged by the digital divides. Students in Metro Manila are among the digitally poor because of its limited access to computers, software, and the Internet, as described by Rodrigo. In the same manner, the dissertation [18] on the prioritization and implementation of information technology in the higher education institutions in the Philippines analyzes the landscape of information technology in the country. It includes security, funding, infrastructure, identity/access management, disaster recovery, governance, teaching and learning, staffing and training, agility and responsiveness, strategic planning, and enterprise resource planning.Marcial revealed that all the said components are highly prioritized but

moderately implemented among the 97 higher education institutions from all over the regions.

The study entitled "Technology Integration in Teacher Education Programs in the Philippines," revealed the complexity of integrating technology because of many variables, which are by themselves complex, influence technology integration [19]. Accordingly, these variables include national, state and school policies; state and local technology plans; funding; teacher skills; the rapidly-changing nature of technology; learning goals and objectives; teacher training and professional development; and technology support. The results of Tan del Rosario's research also point to emerging themes to be attendant in technology integration. Rodrigo disposes of that within the framework of developing countries, the influence of modernization and the desire of these countries to become modernized areimproved by using ITs as strategic tools. Whether IT is introduced as an added course or infusedintothe curriculum.

Also, the study [20]concludes, "HEIs should try to capitalize on 21st-century tools and technologies to address 21st-century issues and challenges." These technologies include computers, the Internet, broadcasting technologies and telephony that enable people to work together to create networks every corner of the globe. ICT, as defined by UNDP [1], is fundamentally a diverse set of applications, goods, and services. It allows teachers and students to create, share, connect and reflect on their learning and that of others [9]. Similarly, the Philippines' Commission on Information and Communications Technology defined ICT as the totality of electronic means for end-users such as computer systems, office systems, and consumer electronics, as well as networked information infrastructure, the components of which include the telephone system, the internet, fax machines and computers [21]. ICT tools are evolving. Hence, implementation strategies have changed toalign betterwiththe current needs. A good illustration of the evolution of ICT in education is the Singapore's ICT Master Plan in Education [cited in 9]. It has three high-level goals of ICT in Education. The year 1997-2002 described the state of shifting from an acquisition process of learning to one that engages higher order thinking like application, synthesis, and evaluation. The Internet, email, and video conferencing tools are among the sample tools used. The year 2003-2008 described the shift of learning from theinformation receiving to information processing and knowledge creation. Integration of ICT into the curriculum and leveraging ICT for formative assessment and summative assessment are among the implementing tools at this stage. Lastly, 2009-2014 aims to have better integration of ICT right from the planning of curriculum and assessment and for teachers to consider pedagogical applications of ICT starting from lesson design and planning stage.

METHODS

The study utilizedthe descriptive-correlative design. It encompassed all the recognized higher education institutions (HEIs) offering any teacher education programs in the four provinces in Region 7, Philippines whether private or public. The respondents of the study are all full-time faculty teaching any professional or specialization courses of the teacher education program in the provinces of Bohol, Cebu, Negros Oriental and Siquijor.A total enumeration of respondents was employed. The identification of HEIs was based on the list given by CHED Region 7 office, dated January 31, 2013. Table 1 shows the summary of the number of HEIs offering teacher education programs in the region.

Table 1. Summary of HEIs offering teacher education program in Region 7

Type of HEIs	Bohol f (%)	Cebu f (%)	Negros Oriental f (%)	Siquijor f (%)	Total f (%)
Public	7 (35.00	17 (27.42)	9 (42.86)	1 (25.00)	34 (31.78)
Private	13 (65.00)	45 (72.58)	12 (57.14)	3 (75.00)	73 (68.22)
Total	20 (100.00)	62 (100.00)	21 (100.00)	4 (100.00)	107 (100.00)

A total of 76 out of 107 HEIs participated during the administration of the survey as shown in Table 2. All schools in Bohol and Siquijor participated in the investigation. In Negros Oriental, 12 out of 21 schools from Negros Oriental participated and included in the analysis of the data. The five HEIs in Negros Oriental which are no longer offering teacher education programs as listed in CHED's database were excluded while some did not return the questionnaires. In Cebu, 40 out of 62 HEIs were included in the analysis of the data. However, there were filled up questionnaires from two schools thatwere rejected due to the qualifications of the person who answered the survey questionnaire. Some of the schools in Cebu opted not to participate in the study, and some did not return the questionnaires after several days of extension. In sum, responses from the 23 (30.26%) public and 53 (69.74%) private HEIs comprised the totality of the data analyzed in this study.

Table 2. Summary of HEIs participated in the study

Type of HEIs	Bohol f (%)	Cebu f (%)	Negros Oriental f (%	Siquijor f (%)	Total f (%)
Public	7 (35.00)	12 (19.35)	3 (25.00)	1 (25.00)	23 (30.26)
Private	13 (65.00)	28 (45.16)	9 (75.00)	3 (75.00)	53 (69.74)
Total	20 (100.00)	40 (100.00)	12 (100.00)	4 (100.00)	76 (100.00)

The instrument used in data gathering to accomplish the particular objectives of the study was a questionnaire. Questions related to ICT competencies are based on UNESCO's ICT Competency Standards for Teachers. Respondents were asked to evaluate the level of their competency according to four choices as described in the UNESCO's ICT Competency Standards for Teachers. Then, a test-retest among 23 qualified testers was conducted to measure the reliability of the instrument. These testers are full-time faculty in Silliman University College of Education teaching in the high school department. They were chosen because they have similar teaching attributes with the respondents. The testers were randomly selected in coordination with the college dean. Administration of the test-retest was conducted in two (2) weeks by distributing the hard copy of the questionnaire. Using statistical software, the test-retest answers were processed. Items that were not significant either at 0.01 or 0.05 levels were removed.

In total, 383 responses were accepted and included in the analysis coming from 76 private and public HEIs in the four provinces. Only full-time faculty members teaching any professional and specialization courses in teacher education program are the qualified respondents. Filled-up questionnaires from unqualified respondents were rejected, including those questionnaires wherein most of the items are unanswered. In this case, 40 survey questionnaires were rejected. The statistical tools employed in the data processing are the weighted mean for measuring the competency level and chi-square for testing the relationships.

Respondents were asked to evaluate the level of their competency according to the four-point scale choices: 0 being the lowest and 3 being the highest level of competency. Each item has a different verbal interpretationthatwas adoptedfrom UNESCO's ICT Competency Standards for Teachers.

RESULTS

ICT Competency Level

This study reveals that the ICT competency level of the respondents has an aggregate mean of 1.62 interpreted as knowledge deepening level, shown in Table3. It is also explicitly indicated that the respondents' lowest level of competency is in the aspect of ICT tools and operation with an aggregate mean of 1.26 described as "basic tools". Furthermore, the data show that the competency in relation to the use of ICT educational policy is described as "understanding level" ($\bar{x} = 1.57$). Regarding policy, the teachers from Negros Oriental have the highest level of competency with an aggregate mean of 1.69 while the teachers from Siquijor have the lowest level of competency with an aggregate mean of 1.36, both described as "understanding level".

Regarding curriculum and assessment, the overall weighted mean of this competency level is 1.72 with the description "knowledge application". In this work aspect, the respondents from Cebu emerged to have the highest mean of competency level ($\bar{x} = 1.88$) described as "knowledge application" while the respondents from Siquijor got the lowest mean ($\bar{x} = 1.55$) described as "knowledge deepening". In the area of pedagogical integration of ICT, the respondents' level of competency across provinces falls within the description, "complex problem solving" having an aggregate mean of 1.81, with Cebu being the highest and Bohol as the lowest. However, 'all the four provinces are of the same verbal description, "complex problem solving".

Notably, among the work aspects, the respondents' lowest level of competence is in the tools and technology having an aggregate mean of 1.26 with a verbal description, "basic tools". In here, still Cebu appeared to be the highest and Siquijor as the lowest. With regards to organization and administration, the teacher respondents' level of competency across provinces is within the verbal description, "collaborative groups". Although on the average, their level of competency fall within such category, but looking at the figures on a per province basis, Cebu and Negros Oriental appeared to be the highest and Siquijor as the lowest with a verbal description, "standard classroom". Moreover, in the teacher professional learning, the teacher respondents' overall extent of competency is within the verbal description, "manage and guide". Once again, Cebu came out as the highest and Bohol as the lowest. Nonetheless, both are with the same description-manage and guide.

Table 3. ICT Competency Level

Work Aspects	Bohol ($\bar{x}$)	Bohol Description	Cebu ($\bar{x}$)	Cebu Description	Negros Oriental ($\bar{x}$)	Negros Oriental Description	Siquijor ($\bar{x}$)	Siquijor Description	Aggregate ($\bar{x}$)	Aggregate Description
Policy	1.60	Understanding Level	1.61	Understanding Level	1.69	Understanding Level	1.36	Awareness level	1.57	Understanding Level
Curriculum & Assessment	1.66	Knowledge Application	1.88	Knowledge Application	1.78	Knowledge Application	1.55	Knowledge Application	1.72	Knowledge Application
Pedagogy	1.65	Complex Problem Solving	1.93	Complex Problem Solving	1.84	Complex Problem Solving	1.83	Complex Problem Solving	1.81	Complex Problem Solving
Tools	1.19	Basic Tools	1.37	Basic Tools	1.29	Basic Tools	1.17	Basic Tools	1.26	Basic Tools
Organization/ Administration	1.68	Collaborative Group	1.75	Collaborative Group	1.75	Collaborative Group	1.50	Standard Classroom	1.67	Collaborative Groups
Teacher Professional Learning	1.61	Manage and Guide	1.69	Manage & Guide	1.76	Manage & Guide	1.69	Manage & Guide	1.69	Manage & Guide
Aggregate Mean	1.57	Knowledge Deepening	1.71	Knowledge Deepening	1.69	Knowledge Deepening	1.52	Knowledge Deepening	1.62	Knowledge Deepening

Table 4.Test of Relationship of ICT competency level among the groups of respondents

ICT Competency	x^2 Value	p-value	df	Remarks
Sex	5.42	0.210	3	Not Significant
Age	13.1	0.011	4	Significant
Civil Status	8.92	0.063	4	Not Significant
Type of Institution	8.35	0.039	3	Significant
No. of years in teaching	17.9	0.057	10	Not Significant
Highest educational attainment	11.5	0.021	4	Significant
Desktop Ownership	4.04	0.132	2	Not Significant
Smartphone Ownership	12.8	0.005	3	Significant
Tablet Ownership	25.2	0.000	3	Significant
Laptop Ownership	17.8	0.000	3	Significant
Internet accessibility in the school	5.47	0.140	3	Not Significant

Table 4 shows the results of the analysis made so as to ascertain whether or not a significant relationship exists between each of the components included in the respondents' profile and their level of ICT competency.

It is worth noting that of the eleven components, 6 or 54.55% appeared to be significantly related to the level of ICT competency. Moreover, these are as follows: age, type of institution, educational attainment, ownership of asmartphone, ownership of atablet, and ownership of the laptop.

On the other hand, the remaining components, namely: sex, civil status, number of years of teaching, ownership of desktop and internet accessibility in school are found to have no significant relationship with the level of ICT competency.

Delineated in Table 5 is the result of the ANOVA analysis in determining whether or not the teacher respondents' level of ICT competency across the four provinces of Region 7 significantly differs. As can be gleaned from the table, the four groups of respondents do not significantly differ. This result is manifested in the p-value of 0.120 which is greater than the margin of error at 0.05. This goes to show that although there are differences in their weighted means, such differences have not reached the significance level. Hence, the teacher respondents from Bohol, Cebu, Negros Oriental and Siquijor are on the same degree of ICT competency.

Table 5. Test of Difference of ICT competency level among the groups of respondents

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.002	3	.667	1.954	.120
Within Groups	128.410	376	.342		
Total	130.412	379			

DISCUSSION

ICT Competency

The overall levelof ICT competency in the teacher's

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work aspects, though it falls at the lower limit of the range level, falls in the knowledge deepening approach. The result suggests that the degree of ICT competency is integrative and collaborative. The result signifies that teacher educators have utilized open-ended software tools for thecollaborative learning experience. UNESCO model states that in the knowledge deepening approach, teachers have the "ability to manage information, structure problem tasks, and integrate open-ended software tools and subject-specific applications with student-centered teaching methods and collaborative projects in support of students' deep understanding of key concepts and their use to solve complex real-world problems."Teachers at this level are able "to use ICT to create and monitor individual and group student project plans, as well as access to experts and collaborate with other teachers making use of networks to access information, colleagues, and other experts in supporting their professional development". Teacher educators in Region 7 especially in Cebu are good in word processing, spreadsheet, presentation, videos and digital materials, and downloading and uploading content from the web.

Shown in figure 2 is the visualization of the result based on UNESCO's standard. The figure shows that ICT integration about policy is understanding stage. It also shows that ICT integration about curriculum and assessment is a knowledge application stage; pedagogy is a complex problem solving; basic tools regarding technology; collaborative regarding organization and administration, and manage and guide regarding teacher professional learning.

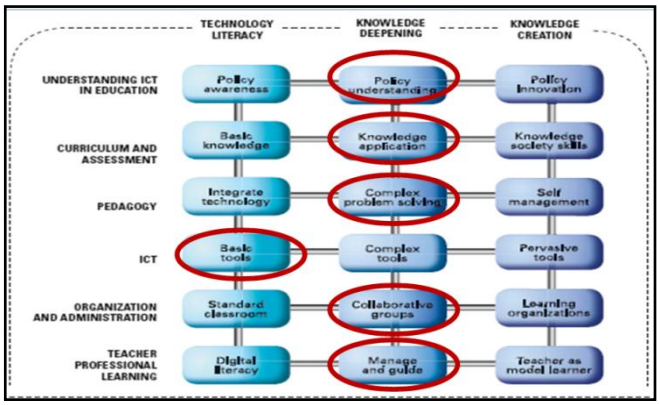

Figure 2. ICT Competency Level of the respondents (image is captured from [11, p. 9]

Use of ICT in Understanding Educational Policy

Curricular goals should include an objective to understand ICT policy. The study asserted "the educational level of different schools is relevant to a nation's ICT policy" [22]. In this study, an understanding status is reflected in the ICT competency about educational policy. Referring to the UNESCO's standards, the teachers in Region7 slightly believe that they can create, modify, and implement classroom practices that support national and social priorities with the use of ICT. It can be asserted that teacher educators especially those from Negros Oriental are aware of ICT policies in the classroom and may have few experiences in the integration. Notably, Siquijor teacher educators may have little knowledge of ICT national policies and social priorities.

ICT Integration in Curriculum and Assessment

ICT integration in curriculum and assessment is described as knowledge application. The result suggests that teacher educators in the region have athoroughknowledge of the subject, and they can apply it flexibly in a variety of situations. The result may also suggest that teachers can create complex problems as a measure of students' understanding. Moreover, the result indicates that teacher educators especially those from Cebu have a thorough knowledge of the subject, enabling them to deal with it flexibly in a variety of situations. On the other hand, the date seemed to suggest that Siquijor teachers can slightly demonstrate a variety of software packages in their subject area. Interestingly, the findings revealed that teachers can "develop and apply knowledge-and-performance-based rubrics that allow teachers to assess student's understanding of key subject matter, concepts, skills, and processes" [11]. Likewise, ICT integration in school's curricula and assessments can make the content more reliable and flexible, and it stimulates learner's interest to be more active and collaborative [23].

Pedagogical Integration of ICT

The respondents rate a description "complex problem-solving" in the pedagogical integration of ICT. UNESCO describes those teachers in the complex problem-solving stage as student-centered. The result further suggests that the teacher educators especially Cebu teachers can organize problem tasks, guide student understanding, and support student collaborative projects using ICT. Bohol teacher educators may have few skills to help students develop, implement, and track project plans and solutions. It may also suggest that they can interpret and discuss ICT-pedagogical integration but may have few experiences in the actual pedagogical infusion of ICT.

ICT Tools

The data elucidate that respondents have the basic literacy in the aspect of ICT tools and operation. This signifiesthat the faculty members in the teacher education were using only the technique of the necessary tools competency. In technology literacy level, teachers only know the necessary hardware and software operations, as well as productivity applications software, a web browser, communications software, presentation software, and management applications. It can be noted that UNESCO defines three approaches of competency regarding the operation of ICT tools [11]. These are basic tools, complex tools, and pervasive technologies. The result indicates that the teacher educators in Region 7 especially Cebu can interpret and discuss the basic computer operation and other information devices including basic troubleshooting and maintenance but have not experienced the actual demonstration of it.It has also been pointed out that the teacher educators, especially those coming from Siquijor, have never implemented the efficient use of the Internet and network applications including resources in the classroom. On the positive note, the result entails that the teachers can work the key components of a computer and managing emails; however, they need help and guidance from an expert.

ICT Integration in Classroom Organization and Administration

The ICT competency level of the respondents in the aspect of classroom organization and administration is collaborative. This is indicative of the fact that the teacher educators in Central Visayas can create flexible classroom learning environments. It is also revealed that teachers, especially from Cebu and Negros Oriental, can integrate student-centered activities and flexibly apply technology to support collaboration. Additionally, the teacher educators in the region have the skills and knowledge to create and manage complex projects, collaborate with other teachers, and make use of networks to access information, colleagues, and outside experts in supporting their professional development. However, the level of ICT competency of the teacher respondents from Siquijor regarding classroom organization and administration is just within thestandard classroom. UNESCO ICT CST described this level "little change in social structure occurs with this approach other than, perhaps, the spatial placement and integration of technology resources in the classroom or inlaboratory". Hence, it can be deduced that the Siquijor teacher educators have difficulty in creating flexible classroom learning environments.

ICT Integration in Teacher Professional Development

The aspect of teacher professional development is described as the acquisition of skills and knowledge both for self-improvement and career advancement. It plays a crucial component in any educational improvement. UNESCO asserts that teacher professional development must be focused on changes, ensures sustainability and must be aligned with other educational system's priorities [11]. However, teacher professional development is an emerging issue in any educational system. Accordingly, professional development of the teacher, his involvement in the process of continuous self-improvement is an important issue today [24].

In this study, the result is described as manage and guide under knowledge deepening. In reference to UNESCO standards, this stage implies "teacher professional development is focused on the use of ICT to guide students through complex problems and manage dynamic learning environments". Likewise, the standard states "teachers in this stage have the skills and knowledge to create and manage complex projects, collaborate with other teachers, and make use of networks to access information, colleagues, and outside experts in supporting their professional development". The result signifies that teacher educators, especially those coming from Negros Oriental, are proficient in evaluating and reflecting on the use of ICT in their profession for development and innovation. There is a need for teacher educators in Region 7 especially those from Bohol to collaborate with peers and stakeholders in advancing the use of ICT in education and beyond.

Relationships and Differences

The result of the test of the relationship between the profile of the respondents and all ICT competencies reveal that demographic profile and techno graphic profile play a critical role in ICT integration. Age is significantly related to the level of ICT competency. Unsurprisingly, this result affirms to the generation gap phenomenon where "Generation Xers and Yers far ahead of both Boomers and Seniors" [25]. The data show that the young adults whose age is within 19-40 have a higher level of competency ($\bar{x}$= 1.71) compared to those middle adulthood with ages 41-65 years old ($\bar{x}$= 1.52) and those at the maturity age ($\bar{x}$= 1.71). The level of ICT competency is also affected by the type of institution. As indicated, the respondents coming from private higher education institutions are better ($\bar{x}$= 1.69)

than those in the public ($\bar{x}$= 1.56). In particular, private institutions in Region 7 are better regarding integration ICT in understanding policy, curriculum and assessment, pedagogy, tools, organization and administration, and teacher professional development. Educational attainment is also affecting the level of ICT competency. Data disclose that those with postgraduate degrees have higher competency ($\bar{x}$= 1.75) compared to those with graduate degrees ($\bar{x}$= 1.69) and bachelor's degree ($\bar{x}$ = 1.53). This can be explained by the respondent's longer academic learning experiences particularly in understanding educational policy, curriculum and assessment, pedagogy, tools, organization and administration and teacher professional development.. Likewise, ICT competency is affected with asmartphone, tablet, and laptop ownership. Obviously, those with smartphones have a higher competency level ($\bar{x}$ = 1.72) than having no smartphones ($\bar{x}$= 1.55), those with laptop have a higher competency level ($\bar{x}$= 1.73) than having no laptop ($\bar{x}$= 1.46), those with tablet havea higher competency level ($\bar{x}$= 1.94) than having none of it ($\bar{x}$= 1.58). This result implies that teacher educators in Region 7 are equipped with the necessary technology towards a student-centered environment. "Pedagogy of constructivist learning theories such as activity theory, social constructivism, and situated learning have been altered and empowered through the use of technology as a tool for learning" [26].

This study shows that sex does not affect the level of ICT competency. It is evident that being male or female does not influence the degree of ICT competency. It may entail that both male and female has common characterstics on socialization, access to computers, experience with computers, attitude and anxiety with computers, and ability with computers [27] are not factors in achieving higher ICT competency level.

In addition, being single or married does not affect ICT competency levels. Surprisingly, number of years in teaching does not affect ICT competency levels consdiering that age and highest educational attainment affect ICT competency. This may be explained about the nature of the respondents teaching work and at the same time the diverse subject matter that the respondent is teaching.

Unexpectedly, owning a desktop does not influence the degree of ICT competency. The result implies that it is not a guarantee that owning a computer at home would increase competencies.It can be noted that Smartphones and laptops affect the ICT competency. Coincidentally, these technologies are considered mobile technology devices. Mobile technology devices range from basic mobile phones to tablet PCs and include PDAs, MP3 players, memory sticks, e-readers, and smartphones [9]. It can be argued that technologies for mobile learning are agood influence for technology adoption. Also, internet accessibility in the school does not affect teacher's ICT competency.

Surprisingly, the result of the test of difference indicates that the ICT competency level in terms of the teacher's work does not vary across the four provinces in Central Visayas. The result suggests that the teachers' integration of ICT policy, curriculum and assessment, pedagogy, tools, organization and administration, and teacher professional learning in Bohol, Cebu, Negros Oriental and Siquijor do not differ. The major characteristic present among the teachers from the four provinces isbeing integrative and collaborative in their teaching instructions.

CONCLUSION AND RECOMMENDATIONS

Based on the findings, it is concluded that there is a slight technology infusion into the teaching instruction among teacher educators in Region 7. The ICT competency of teacher educators in Region 7 is starting to utilize ICT tools in understanding theeducational policy, curriculum and assessment, pedagogical approach, operations, classroom organization and administration, and teacher professional development. Teacher educators in Region 7 are applying the basic tools,but they do not possess the necessary skills towards innovative teaching and learning. They use and apply basic ICT tools with the desire to achieve innovative teaching and learning. There is an urgent need to increase the level of ICT competency among the teacher educators especially in the concepts and operations of technology. There is also a need to improve understanding ICT policy in the classroom as well as using ICT in classroom organization and management. ICT competency may improve positive pedagogical benefits among the future professional teachers.

It is recommended to revisit collaborative efforts between the government, academe, and industry. The Philippine government through CHED should implement its mandate in integrating ICT in the teaching and learning process seriously. HEIs must prioritize programs that will emphasize ICT in education; however, an education policy for ICT should be established first. Teachers must take advantage of existing and available tools offered in their institution or other organizations that emphasize open learning. It is

highly recommended that ICT skills enhancement training for teacher educators be regularly conducted. Training providers should refer to any existing competency standards like UNESCO ICT CST, ISTE Standards·T, and among others. They should carefully customize the standards to make it scalable and adaptable to the school.

The competencies in the teacher's work aspects included in the study were limited to the general work aspects described in the UNESCO framework. A study should be conducted to include other skills like those considered as 21st-century tools.The Philippine government through DOST and CHED in partnership with private and non-government agencies should develop a new competency standard that is realistic, adaptable and scalable in the regional places. In addition, all stakeholders must view ICT integration in education as a program and not by specific domains and aspects.

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