PEDAGOGICAL INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGY AMONG TEACHER EDUCATORS IN CENTRAL VISAYAS, PHILIPPINES

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Information and communication technology (ICT) changes the way education is delivered. ICT highly supports student-centered environment. This paper examines the level of pedagogical integration of ICT among teacher educators in Central Visayas, Philippines. The study used a survey questionnaire based on the National ICT Competency Standard for Teachers. A total of 383 responses from 76 private and public higher education institutions were included in the analysis using weighted mean and chi-square. The study reveals that the level of pedagogical integration of ICT among the teacher educators is moderate. The result implies that the teacher educators are familiar with the pedagogical operations of ICT but have not experienced the actual implementation of it. The level of competency in the pedagogical integration of ICT is affected by age, status, institution, and number of years in teaching. Teacher educators from private higher education institutions (HEIs) have a higher competency level than those who are affiliated from public HEIs. Those who have a desktop, Smartphone and a laptop computer with Internet accessibility have a higher competency

level than those who have not. From the data it can be said that the pedagogical integration of ICT among teacher educators is at the learning level only.

KEYWORDS: descriptive, educational technology, ICT in education, pedagogy, Philippines, teacher education

INTRODUCTION

THE WEBSITE *Teaching Teachers for the Future* has made the observation that information and communication technology (ICT) changes teaching and learning. It changes the way teachers teach, and students learn; it transforms pedagogy. Collaborative and interactive teaching strategies require a new method of pedagogy like the ICT integration in teaching and learning (Cox et al., 2003). Likewise, Kollias & Kikis (2005) suggested a pedagogical-independent definition of ICT-related pedagogical innovations in schools. They stated that "pedagogic innovations in the use of ICT in schools are those activities where innovation agents integrate existing or new ICT-related pedagogic theories, knowledge, processes and/or products in schools." They cited that pedagogical practices include: promoting active learning, providing students with competencies and technological skills, stimulating students in collaborative and project-based learning, providing students with customized instructions, addressing issues of equity for students, "breaking down the walls" of the classroom, and improving social cohesiveness and understanding. ICT is a knowledge construction tool helpful in achieving authentic and realistic problem-based approaches to teaching and learning (Prestridge, 2012).

However, there are many challenges and barriers to integrating ICT in the classroom. These barriers include cultural, behavioral, technical, and financial aspects (Samire, 2012). Marcial (2012) ranked the following obstacles of ICT integration as encountered by teachers in higher education: [1] limited number of Internet-connected PCs in the faculty room; [2] inadequate number of electronic audio and visual equipment; [3] limited bandwidth that results to slow internet connection for online activities; [4] inadequate number of computers available in the faculty room;

[5] lack of knowledge and training in using the available e-learning tools; [6] not enough time to develop e-learning materials for classroom instruction; [7] get used to and contented with the traditional mode of instruction; [8] afraid to use computers and other electronic equipment; and [9] unavailability of software applications installed in the computer for faculty use.

Globally, the study of ICT in the classroom is well-researched most especially in the developed countries. On the same manner, studies from developing countries contribute equally significant results in the integration of ICT in education. Moreover, several studies in the Philippines also reported that ICT impacts teaching and learning. However, few know of these studies that focused on the pedagogical integration of ICT among teacher educators in the central part of the Philippines.

This paper presents a supplemental discussion about the ICT competence in the teacher education program in Region 7 particularly on the pedagogical integration of ICT. Specifically, this paper describes the level of competence in relation to the pedagogical use of ICT among teacher educators in Central Visayas, Philippines. It also explains the relationships between the respondent's demographic profile such as sex, age, status, type of institution, number of years in teaching, highest educational attainment and the level of ICT competency in operations and concepts. Likewise, it also presents the relationship between the respondent's technology ownership of a desktop, Smartphone, tablet, and a laptop and the ICT competency level in operations and concepts as perceived by the respondents. Lastly, the paper presents the relationship between Internet accessibility and ICT-pedagogical use.

RELATED LITERATURE

The well-studied framework about pedagogy and technology is the Technological Pedagogical Content Knowledge (TPACK). As defined in its website [tpack.org], "TPACK is a framework that identifies the knowledge teachers need to teach effectively with technology" (Figure 1). The TPACK framework is an extension of the Shulman's idea of Pedagogical Content Knowledge. It has seven components that include content knowledge, pedagogical knowledge, technology knowledge, pedagogical content

knowledge, technological content knowledge, technological pedagogical knowledge, and technological pedagogical content knowledge. On the website, it explains

> At the heart of the TPACK framework, is the complex interplay of three primary forms of knowledge: Content (CK), Pedagogy (PK), and Technology (TK). The TPACK approach goes beyond seeing these three knowledge bases in isolation. TPACK also emphasizes the new kinds of knowledge that lie at the intersections between them, representing four more knowledge bases applicable to teaching with technology: Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and the intersection of all three circles, Technological Pedagogical Content Knowledge (TPACK).

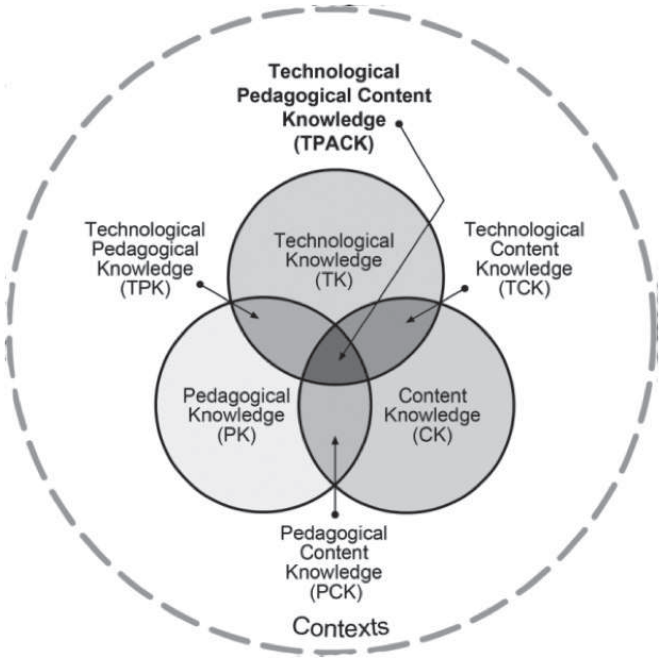

Figure 1. **Technological Pedagogical Content Knowledge (TPACK) Model**. Reproduced by permission of the publisher, © 2012 by tpack.org

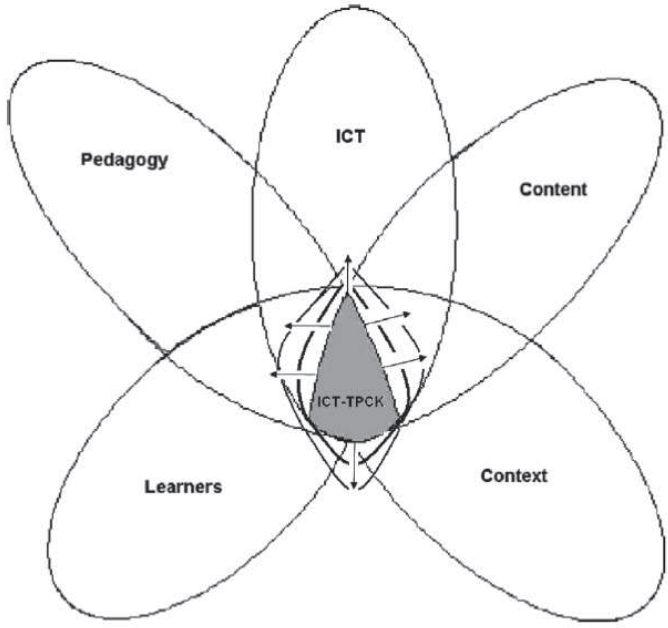

Figure 2. **ICT-TPACK.** Adapted from Angeli and Valanides (2009), p. 157.

Furthermore, TPACK framework is a generative framework helpful to pre-service teachers. It guides pre-service teachers' preparation to integrate ICT into classrooms teaching and learning (Chai, Koh, Tsai, Lee, & Tan, 2011). As a strand of TPACK, ICT-TPCK was introduced by Angeli and Valanides (2009) (Figure 2). They described ICT-TPCK as "the ways knowledge about tools and their affordances, pedagogy, content, learners and context are synthesized." They explained that topics that are difficult to be understood by learners or hard to be presented by teachers could be taught more effectively with technology. Hennessy et al. (2007) concluded that the use of ICT allows students to engage in ''What If'' explorations. However, field experience with educational technology courses are vital components in the design and implementation of technology-integrated lessons. It was found that both variables could significantly influence pre-service teachers' ability to combine content, pedagogy and technology (Mouza, Karchmer-Klein, Nandakumar, Ozden, & Hu, 2014).

The Bangkok website of UNESCO (2011) has declared that "the use of ICT can contribute to a movement towards constructive teaching approaches, and constructive teaching processes can

lead to greater use of ICT in education." The UNESCO ICT framework explained that "the former approach is the traditional method while the latter refers to a way of teaching that demands a redefinition of the traditional teacher-student relationship." This method is adapted by Trinidad (2003) explaining that this shift from having a teacher-centered to learner-centered environment is not easy, and it entails a long and rigorous process. Shown in table 1 is a comparison between the types of pedagogy, and teacher-centered and learner-centered environments.

Table 1. **Teacher-centered and Learner-centered Learning Environment.**

	Teacher-centered learning environments	**Learner-centered learning environments**
Classroom activity	Teacher-centered. Didactic.	Learner-centered. Interactive.
Teacher's role	Fact teller, primary source of information, content expert, and source of all answers.	Collaborator, mediator, mentor, coach, sometimes co-learner and knowledge navigator. Gives students more options and responsibilities for their own learning.
Student's role	Passive recipient of information, reproducing knowledge, learning as a solitary activity.	Active participant in the learning process, producing and sharing knowledge, participating at times as expert, learning collaboratively with others.
Instructional emphasis	Facts, memorization, and accumulation of facts.	Relationships, inquiry, and invention. Transformation of facts.

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Table 1. **Teacher-centered and Learner-centered Learning Environment.** (CONTINUED...)

	Teacher-centered learning environments	Learner-centered learning environments
Concepts of knowledge	Quantity, comprehension, and accumulation of facts.	Quality of understanding, application, synthesis, and evaluation.
Demonstration of success	Norm-referenced	Criterion-referenced
Assessment	Multiple-choice items, exams, and essays	Portfolios and performance or product-based assessment
Technology use	Drill and practice, rote learning, presenting via PowerPoint	Communication, access, collaboration, expression, sharing of data, and e-learning

Adapted from Sandholtz, Ringstaff, and Dwyer (1997) and UNESCO (2011), as cited in Trinidad (2003), p. 99.

Among the popular technologies in a learner-centered learning environment is the e-learning. E-learning is broadly inclusive of all forms of ICT in teaching and learning. Because of this, e-learning evolves according to its composition and delivery method. Some of the common terms of e-learning includes multimedia learning, technology-enhanced learning, technology-rich learning environments, computer-based instruction, computer-based training, computer-assisted instruction or computer-aided instruction, Internet-based training, web-based training, online education, virtual education, virtual learning environments, mobile-learning, and digital educational collaboration. These names vary according to pedagogical perspectives or learning theories. Among these are social-constructivist, and Laurillard's Conversational Model including Gilly Salmon's five-stage model, cognitive, emotional, behavioral, and contextual perspective. For Mayes & de Freitas (n.d.), e-learning can be viewed in three broad theoretical perspectives: associationist, cognitive, and situative.

Emerging pedagogical trends that geared towards a student-centered environment are open learning, increased sharing of power between the professor and the learner, and increased use of technology (Ontario Online Learning Portal, n.d.). The portal

describes ICT integration's role as not only to deliver teaching, but also to support and assist students and to provide new forms of student assessment. Further, pedagogy is becoming complex and dynamic like learning analytics. Kanwar (2014) showed two examples of learning analytics; these are predictive systems and recommender systems. Both systems require sophisticated computer programming. Computerized pedagogical planners (Olimpo et al., 2010), outcomes-based education planners and makers, web-based service-learning systems among others are now changing the landscape in pedagogy.

The UNESCO ICT Competency Standards for Teachers also address six components of the educational system. It is essential to note that the Standards do not merely focus on ICT skills. Rather, they include training in ICT skills as part of a comprehensive approach to education reform that includes: policy, curriculum and assessment, pedagogy, the use of technology, school organization and administration, and teacher professional development. It can be noted that UNESCO (2011) defined three approaches of ICT competency in pedagogy. These are *integrate technology, complex problem-solving, and self-management.* Described in the UNESCO ICT CST, *integrate technology* approach refers to the changes in pedagogical practice that involve the integration of various technologies, tools, and e-content as part of a whole class, group, and individual student activities to support didactic instruction. *Complex problem-solving* approach includes collaborative problem- and project-based learning in which students explore a subject deeply and bring their knowledge to bear on complex, everyday questions, issues, and problems. The *self-management* approach is described as that phase when students are working in a learning community in which they are continuously engaged in creating knowledge products and building on their own and each other's knowledge base and learning skills.

Similarly, the Philippines has its own competency standard. Formulated by the Commission on Information and Communication Technology, the National ICT Competency Standard for Teachers, also known as NICS-Teachers came out in 2006. The national standard defines the competency outcomes, and the supporting knowledge and skills needed to deploy ICT in performing the job roles related to teaching. NICS-Teachers is supported by various public and private interest groups that seek to improve pre-service and in-service trainings of teachers on

the use of ICT in education. References of NICS-Teachers include ISTE NETS·S and IFIP Curriculum-Professional Development of Teachers. NICS-Teachers consists of four elements such as skill set standard that describes the key area of competency, a descriptor that describes the covered skills set, statements that describe the outcome in terms of the key areas of competence, and indicators that determine the actions the individual would take to manifest scope of competence. Most importantly, NICS-Teachers consists four domains of skill set. One of the domains is pedagogical integration that includes competencies related to the use of technology in the components in instruction processes. These processes are [1] planning and designing effective learning environments and experiences supported by technology; [2] implementing, facilitating and monitoring teaching and learning strategies that incorporate a variety of ICT to develop and improve student learning; and [3] assessing and evaluating student learning and performances. The pedagogical domain in NICS-Teachers has six competency standards. Digital tools specified in the standard include databases, spreadsheets, concept mapping tools, communication tools, data analysis tools, slide presentations, multimedia tools, email, Web 2.0, computer-based assessments and evaluation, and online repositories (NICS-Teachers, n.d.).

METHODOLOGY

Design and Environment

The study implemented a descriptive-correlative approach and utilized a survey method. The study was conducted in all recognized higher education institutions (HEIs) offering any teacher education programs in the four provinces in Region 7, Philippines. 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. All private and public HEIs including community colleges were included (Table 2). The respondents of the study are all full-time faculty teaching any professional or specialization courses of teacher education program in the provinces of Bohol, Cebu, Negros Oriental and Siquijor.

Respondents

All HEIs offering teacher education programs in Region 7 were considered. 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 2 shows the summary of the number of HEIs offering teacher education programs in the region.

Table 2. **Summary of HEIs Offering Teacher Education Program in Region 7.**

Type of HEIs	Bohol		Cebu		Negros Oriental		Siquijor		Total	
	f	%	f	%	f	%	f	%	f	%
Public	7	35.00	17	27.42	9	42.86	1	25	34	31.78
Private	13	65.00	45	72.58	12	57.14	3	75	73	68.22
Total	**20**	**100.00**	**62**	**100.00**	**21**	**100.00**	**4**	**100**	**107**	**100.00**

A total of 76 out of 107 HEIs participated during the administration of the survey (Table 3). 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 study. Five HEIs in Negros Oriental are no longer offering teacher education program as listed in CHED's database. Some HEIs in Negros Oriental did not return the questionnaires. In Cebu, 40 out of 62 HEIs were included in the analysis of the study. There were filled out questionnaires from two schools rejected due to the qualifications of the persons who answered the survey tool. Some Cebu schools opted not to participate in the study, and some did not return the questionnaires after several days of extension. In total, responses from 23 (30.26%) public and 53 (69.74%) private HEIs were included in the study.

Table 3. **Summary of HEIs participated in the Study.**

Type of HEIs	Bohol		Cebu		Negros Oriental		Siquijor		Total	
	f	%	f	%	f	%	f	%	f	%
Public	7	35.00	12	19.35	3	25.00	1	25	23	30.26
Private	13	65.00	28	45.16	9	75.00	3	75	53	69.74
Total	20	100.00	40	100.00	12	100.00	4	100	76	100.00

Instrument

The instrument used in data gathering to accomplish the specific objectives of the study was a survey questionnaire. Questions related to ICT competencies in teacher development were based on the Philippine's National ICT Competency Standards for Teachers. Respondents were asked to evaluate the level of their competency according to the five-point Likert scale choices: 1—poor (don't know anything about it); 2—fair (just read from a book/heard it from others); 3—good (has the ability to explain and discuss the task but has not experienced the actual process); 4—very good (has the ability to perform and carry out the task but needs the help, advice, and guidance from an expert); and 5—excellent (has the ability to perform and carry out the task proficiently without the help of an expert). The questionnaire was drafted based on national and integration competency standards. 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.

Administration and Statistical Treatment

The survey administration process was done in two distribution periods. In total, 383 responses were accepted and included in the analysis coming from 76 private and public HEIs in the four provinces. Filled-out questionnaires from unqualified respondents were rejected, including those questionnaires that were mostly unanswered. In this case, 40 survey questionnaires were rejected. The statistical tools employed in the data processing were the weighted mean for measuring the competency level and chi-square for testing the relationships.

Table 4. **ICT Competency Level in Pedagogical Domain.**

Pedagogical Skills	Bohol ($\bar{x}$) Description	Cebu ($\bar{x}$) Description	Negros Oriental ($\bar{x}$) Description	Siquijor ($\bar{x}$) Description	Total ($\bar{x}$) Description
Making students use databases, spreadsheets, concept mapping tools and communication tools, etc.;	(2.52) Fair	(2.89) Good	(2.63) Good	(2.57) Fair	(2.65) Good
Encouraging students to do data analysis, problem solving, decision making, and exchange of ideas;	(2.81) Good	(3.10) Good	(3.04) Good	(2.93) Good	(2.97) Good
Using appropriately slide presentations, videos, audio and other media in the classroom;	(3.15) Good	(3.40) Very Good	(3.34) Good	(3.43) Very Good	(3.33) Good
Teaching students to use various multimedia materials for the reports and class presentations;	(3.06) Good	(3.40) Very Good	(3.32) Good	(3.07) Good	(3.21) Good
Using various synchronous and asynchronous communication tools (email, chat, white boards, forum, blogs);	(2.80) Good	(3.18) Good	(3.01) Good	(2.86) Good	(2.96) Good
Facilitating cooperative learning and exchange of ideas and information;	(3.25) Good	(3.41) Very Good	(3.35) Good	(3.14) Good	(3.29) Good
Using electronic means of administering quizzes and examinations;	(2.60) Good	(2.79) Good	(2.74) Good	(2.64) Good	(2.69) Good
Analyzing assessment data using spreadsheets and statistical applications;	(2.69) Good	(2.79) Good	(2.72) Good	(2.36) Fair	(2.64) Good

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Table 4. **ICT Competency Level in Pedagogical Domain.** (CONTNUED...)

Pedagogical Skills	**Bohol (*x*) Description**	**Cebu (*x*) Description**	**Negros Oriental (*x*) Description**	**Siquijor (*x*) Description**	**Total (*x*) Description**
Exploring the use of electronic assessment tools like on line testing, submission of projects via email or on line facilities;	(2.65) Good	(2.83) Good	(2.72) Good	(2.29) Fair	(2.62) Good
Setting up online databases or repositories of student works.	(2.46) Fair	(2.54) Fair	(2.57) Fair	(2.21) Fair	(2.45) Fair
Aggregate Mean	(2.80) Good	(3.03) Good	(2.94) Good	(2.75) Good	(2.88) Good

RESULTS AND DISCUSSION

Competency Level of ICT Pedagogical Integration

Table 4 is the level of ICT competency of the respondents in relation to the pedagogical integration. This domain includes competencies related to the use of technology in the teaching instruction as listed in NICS-Teachers. The respondents perceived themselves to have "good" competency in terms of the pedagogical integration of ICT with a total mean of 2.88. Specifically, the data showed that the capability of setting up online databases or repositories of student works was rated fair in all provinces with $\bar{x}$ = 2.21 in Siquijor, $\bar{x}$ = 2.46 in Bohol, $\bar{x}$ = 2.54 in Cebu and $\bar{x}$ = 2.57 in Negros Oriental. Bohol teachers perceived also that they have a fair level of competency in making students use databases, spreadsheets, concept mapping tools and communication tools ($\bar{x}$ = 2.52). Cebu teachers perceived themselves to be very good at facilitating collaborative learning and exchange of ideas and information ($\bar{x}$ = 3.41), using appropriately slide presentations, videos, audio and other media in the classroom ($\bar{x}$ = 3.40), and teaching students to use various multimedia materials ($\bar{x}$ = 3.40). Teachers from Siquijor perceived themselves to be very good also in using slide presentations, videos, audio and other media in the classroom ($\bar{x}$ = 3.43). However, they have many fair levels of pedagogical competencies such as skills in making students use databases, spreadsheets, concept mapping tools and communication tools ($\bar{x}$ = 2.57), analyzing assessment data using spreadsheets and statistical applications ($\bar{x}$ = 2.36) and exploring the use of electronic assessment tools like online testing, submission of projects via email or online facilities ($\bar{x}$ = 2.29).

The result implies that teacher educators in the region can interpret and discuss ICT pedagogically, but have not experienced the actual pedagogical infusion of ICT. Specifically, the result suggests that the respondents have not used communication and data analysis software in their teaching and have not acquired the full potential of using communication software. One website pointed out that "the availability of communicating (and learning) through the Internet has brought phenomenal resources into the lives of anyone connected to it." The website further described that online communication tools are used in order "to bring 'experts' into the classroom, to collaborate with other classrooms across

the globe, to connect with guest readers, [to] address the learning styles of their digital-age students, as well as [use] research-based 'best practices'." Among the most common synchronous web-based communication tools that is being utilized in the classroom, is Skype. Teachers must take advantage of this tool.

Likewise, the result entails that the respondents can discuss but have not experienced applying data analysis software to develop students' higher order thinking skills and creativity. It can be noted that data analysis software is a computer program to inspect, clean, transform, and model data with the goal of highlighting useful information, suggesting conclusions and supporting decision making. Data analysis software is commonly used in business, science, and social science domains. This fact may be the reason that the teacher educators have a moderate level of pedagogical integration in their teaching.

Further, the result also entails that the respondents can interpret, but have not experienced performance tasks for students to locate and analyze information and to use a variety of media to clearly communicate results. It may imply that the respondents have not used a variety of presentations and multimedia software. Research shows that the use of presentation software provides pedagogic benefits in the classroom. Nouri and Shahid (2008) suggested that the use of presentation software such as MS PowerPoint improves students' attitudes toward the instructor and course presentation. They also asserted that MS PowerPoint presentations may improve short-term memory depending on the topic discussed and the students' preferred presentation style. On the other hand, the use of video impacts education in three key concepts: interactivity with content, engagement, and knowledge transfer and memory (Zanetis, 2012). Further, Learningshrew's website cited several studies about the advantages of video-sharing in education. These include [1] video-sharing can be more engaging, enjoyable and motivating than other educational tools (Kay, 2012); [2] video instruction led to statistically-measurable better knowledge when tested than a pamphlet, as well as being more enjoyable (Armstrong et al., 2011); [3] video-sharing puts the students in control of when and where they access the information, and allows them to repeat all or part of the learning as needed (Hill & Nelson, 2011); [4] video-sharing widens access to education; [5] video makes possible the idea of the "Flipped Classroom"; and [6] video can generate data which can then be

extremely helpful in determining educational approaches.

Moreover, the result also suggests that the respondents are familiar, but have not experienced conducting open and flexible learning environments to support collaborative learning. It entails that the respondents are not integrating Web 2.0 tools into their teaching. In the report of an independent Committee of Inquiry into the impact on higher education of students' widespread use of Web 2.0 technologies in UK, Web 2.0 (or Social Web technologies) is described as "technologies that enable communication, collaboration, participation and sharing." Examples of Web 2.0 include social networking sites, blogs, wikis, folksonomies, video sharing sites, hosted services, web applications, and mashups. On the other hand, cooltoolsforschools.wikispaces.com categorized Web 2.0 according to its academic use. Web 2.0 tools include presentation tools, collaborative tools, research tools, video tools, slideshow tools, audio tools, image tools, drawing tools, writing tools, music tools, organizing tools, converting tools, mapping tools, quiz and poll tools, graphing tools, creativity tools, widgets, and file storage & web pages. Simões & Gouveia (2008) asserted that"Web 2.0 services allow the harnessing of the power of groups." They recommended that higher education should promote open and participatory ICT architectures so that students could use and produce their content. One of the most popular Web 2.0 sharing tools is Slideshare. Teachers must take advantage of this tool.

Notably, the result suggests that the respondents are aware, but have not experienced using electronic assessment and evaluation tools that are interactive and adaptable to the diverse learners. Scalise & Gifford (2006) asserted that computer-based assessment offers "powerful scoring, reporting and real-time feedback mechanisms." Higher education institutions must develop an assessment-centered e-learning system for improving student learning effectiveness (Wang, 2014).

Relationships between ICT Pedagogical Competency Level and the Respondent's Demographic and Technological Profile

There are many factors that affect effective pedagogical integration of ICT. Kreijns, Van Acker, Vermeulen, & Van Buuren (2013) revealed that the proximal variables attitude, subjective norm, and self-efficacy towards ICT learning materials were significant

predictors of teachers' intention to use ICT learning materials. They added that attitudes, subjective norm, and self-efficacy mediated the effects of the three distal variables on intention: previous use, perceived knowledge and skills, and colleagues' usage of ICT learning materials. They recommended persuasive communication and skills based training as appropriate interventions. In the same manner, Liu (2011) concluded that constructivist teaching with technology to enhance student achievement could influence teacher beliefs and practices.

The results of chi-square computation for determining if significant relationships exist between the pedagogical integration of ICT and demographic profile among the respondents (Table 5) shows that there is a significant relationship between the pedagogical integration of ICT and the respondent's age (x^2 (8, N = 383) = 36.20, p < .01). Age category is based on Erikson's stages of development, such as young adulthood (19-40), middle adulthood (41-65), and maturity (66-death). Like the existing literature, this study reveals that the young adult teachers garnered highest mean ($\bar{x}$ = 3.12) of pedagogical integration of ICT and the mature teachers getting the lowest ($\bar{x}$ = 2.06). The study also shows that there is a significant relationship between the pedagogical integration of ICT and the respondent's status (x^2 (8, N = 377) = 22.50, p < .01). Unmarried respondents are higher in terms of the level of ICT competency ($\bar{x}$ = 3.24). Similarly, the data also shows that type of institution is correlated with the level of pedagogical integration of ICT (x^2 (4, N = 377) = 11.20, p < .05). Respondents coming from the private schools are better ($\bar{x}$ = 3.05) in their pedagogical use of ICT compared to those who are coming from the public schools (x = 2.84). There is a strong evidence of significant relationship between the respondent's number of years in teaching and level of pedagogical integration of ICT (x^2 (16, N = 383) = 49.00, p < .01). Interestingly, respondent's sex and highest educational attainment are not significantly related to the level of competency in the ICT-pedagogy integration.

In the same manner, the results of chi-square computation for determining if significant relationships exist between the pedagogical integration of ICT and respondent's technology ownership (Table 6) shows that there is strong evidence of significant relationship between the pedagogical integration of ICT and the respondent's ownership of desktop (x^2 (4, N = 383) = 26.50, p < .01). Pedagogical integration of ICT is also affected also

Table 5. **Relationships Between ICT Pedagogical Competency Level and the Respondent's Demographic Profile**

ICT Pedagogical Competency Level and...	x^2 Value	P value	df	Remarks
Sex	2.27	0.687	4	Not Significant
Age	36.20	0.000	8	Significant
Status	22.50	0.004	8	Significant
Type of institution	11.20	0.024	4	Significant
No. of years in teaching	49.00	0.000	16	Significant
Highest educational attainment	7.00	0.537	8	Not Significant

by smartphone ownership (x^2 (4, N = 383) = 17.40, p < .01) and laptop ownership (x^2 (4, N = 383) = 15.50, p < .01). Respondents who have computers like desktop ($\bar{x}$ = 3.18), smartphone ($\bar{x}$ = 3.17) and laptop ($\bar{x}$ = 3.14) have higher competency compared to those who have not ($\bar{x}$ = 2.53), ($\bar{x}$ = 2.79) and ($\bar{x}$ = 2.65). Further, internet accessibility is also a factor that may affect the pedagogical use of ICT in teaching and learning. Respondents with internet access at school have higher levels of pedagogical use of ICT ($\bar{x}$ = 3.04)

Table 6. **Relationships Between ICT Pedagogical Competency Level and the Respondent's Technology Ownership.**

ICT Pedagogical Competency Level and...	x^2 Value	P value	df	Remarks
Desktop ownership	26.50	0.000	4	Significant
Smartphone ownership	17.40	0.002	4	Significant
Tablet ownership	7.50	0.112	4	Not Significant
Laptop ownership	15.50	0.004	4	Significant
Internet accessibility in the school	15.30	0.004	4	Significant

compared to those who do not have ($\bar{x}$ = 2.33). On the other hand, tablet ownership has no correlation with the pedagogical integration of ICT. This can be argued that the respondents have no idea on how tablet computers support mobile learning as a new pedagogy in teaching and learning.

SUMMARY AND CONCLUSIONS

The pedagogical integration of ICT in relation to the teacher's skills domain is rated moderate, and it is at the learning level only. The level of competency in the pedagogical integration of ICT is affected by the respondent's age, status, institution, and number of years in teaching. It is noted that teacher educators from private HEIs have a higher competency level than those who are affiliated with public HEIs. Those who have a desktop, Smartphone and a laptop with internet accessibility have a higher competency level than those who do not own these gadgets.

ICT does not guarantee positive pedagogical benefits. Understanding pedagogical principles underlying the use of ICT in education is the key to innovation (Correa, Losada & Karrera, 2010). Pedagogical use of ICT in education is coupled with many theoretical and learning perspectives. Teachers must evaluate its usage and integration carefully while keeping in mind that ICT in teaching and learning is not all about the latest and the most advanced technology. They need to be proactive and responsive to their teaching strategies in order to support, guide and facilitate learning (Cox et al., 2003). They must keep in mind that ICT should be coupled with content and pedagogy.

RECOMMENDATIONS

It is highly recommended that in-house 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, NICS-Teachers. They should carefully customize the standards to make it scalable and adaptable to the school. However, they should also include recent skills like those considered as 21st century tools. Most importantly, teachers must seriously immerse themselves in innovative

teaching that create student-centered learning environment.

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