PRE-SERVICE TEACHERS' TEACHING READING EFFICACY BELIEFS, TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE (TPCK) LEVELS, AND THEIR TEACHER EDUCATORS' MODELING

Reynald M. Cacho

Submitted in Partial Fulfillment of the Requirements for the
Degree of Master of Arts in Education
(Language and Literacy Education)
in the
Faculty of Education
University of the Philippines Open University
Los Baños, Laguna
June 2012

APPROVAL SHEET

This thesis attached hereto, entitled **"PRE-SERVICE TEACHERS' TEACHING READING EFFICACY BELIEFS, TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE (TPCK) LEVELS, AND THEIR TEACHER EDUCATORS' MODELING"**, prepared and submitted by Reynald M. Cacho, in partial fulfillment of the requirements for the degree of Master of Arts in Education (Language and Literacy Education) is hereby accepted.

NEMAH N. HERMOSA
Adviser

PORTIA P. PADILLA
Reader/Critic

MA. THERESA L. DE VILLA
Member

Accepted in partial fulfillment of the requirements for the degree of Master of Arts in Education (Language and Literacy Education)

PATRICIA B. ARINTO
Dean

ACKNOWLEDGEMENTS

I am forever indebted to...

GOD ALMIGHTY, for making things possible,

Dr. Nemah N. Hermosa, my thesis adviser, for her sustained guidance, wisdom, heartfelt support and for selflessly sharing her knowledge and time which exponentially contributed to the conception and completion of this labor of love,

Prof. Portia P. Padilla, reader-critic for her insights, constructive comments, suggestions and enthusiastic encouragement in accomplishing this study,

Dr. Ma Theresa L. De Villa, panel member, for her intelligent criticisms, timeless wit, insights, and moral support,

Prof. Grace Reoperez, Prof. Naomi Fontanos, and Dr. Roel V. Avila, for sharing their expertise and time to review and/or validate the three instruments of this study,

Prof. Honesto Camino of the Polytechnic University of the Philippines, for his statistical contribution and assistance,

The Philippine Normal University, Lopez, Quezon Campus, especially to Dr. Edgardo S. Villaseñor, Executive Director, and Prof. Necitas R. Delos Santos, Head of Planning, Research and Extension, in providing essential information and in showing enthusiasm to create opportunities in the data gathering and completion of this study,

The PNU pre-service teachers, now, Alumni Batch 2011-2012, for their cooperation and participation in the pilot testing, field testing and actual survey administration,

Mrs. Madelyn M. Mapanao, English Department Head of Lopez National Comprehensive High School, for her utmost support and understanding in the times I need most in accomplishing this work.

My students, friends and colleagues from PNU and LNCHS, who are always there for me and I am for them as we all work together and excel to attain quality education,

Mommy Analyn, Daddy Lito and other beloved relatives who understand and support me in all my local and international endeavors,

Lastly, my loving wife, Lynle, and affectionately handsome son, Jonald Rey, very much like his father or even more, to whom this thesis is dedicated.

Reynald M. Cacho

ABSTRACT

Preparing efficacious literacy teachers for technology-enhanced instruction is beginning to become a main concern for many teacher education institutions. With the emerging technologies coming into the landscape, pre-service teachers and teacher preparation programs are challenged to embrace the opportunities in improving the teaching-learning process along the Technological Pedagogical Content Knowledge (TPCK) Framework. This study investigated the relationships among the pre-service teachers' perceived teaching reading efficacy beliefs, TPCK levels, and teacher educators' TPCK modeling.

A descriptive survey method with focus on quantitative data collection and analysis was adapted. Forty-seven respondents were lottery drawn from 157 graduating pre-service teachers of Bachelor of Elementary Education at the Philippine Normal University Lopez, Quezon campus. Three self-report Likert type instruments were employed for self-assessment of the respondents' teaching reading efficacy beliefs, TPCK levels and their teacher educators' TPCK modeling.

Findings reveal that the pre-service teachers maintain a high sense of efficacy in teaching reading and very good TPCK levels. The pre-service teachers report that their university-based teacher educators have high competence and oftentimes model TPCK in the classroom while their cooperating teachers have shown some competence and sometimes demonstrate TPCK in their student teaching program.

Using the Pearson *r* at .05 level of significance, it was established that moderate but statistically significant relationship existed between teaching reading efficacy beliefs and pre-service teachers' TPK and PCK levels. There is no significant relationship between efficacy beliefs and teacher educators' TPCK modeling. Although there is no significant relationship existing between the pre-service teachers' TPCK

levels and the Grade 1 to 6 cooperating teachers' TPCK Modeling, significantly strong positive relationship, as a whole, has been found between TPCK levels of pre-service teachers and their university-based teacher educators' TPCK modeling. Implications germane to the transformational leadership of school administrators and teacher educators in the 21st century educational paradigm are forwarded.

TABLE OF CONTENTS

Table of Contents Continued

LIST OF FIGURES

LIST OF TABLES

CHAPTER I

INTRODUCTION

BACKGROUND OF THE STUDY

To enhance lives, human beings have been trying to tap technology in whatever form it takes ever since the Stone Age. From the invention of the press to the development of computers, humanity has become eager to utilize technology in order to improve lives (Holmes, 2003). On the pedagogical side of this development, teaching in the information age requires teachers to modify their view and transform their instructional practices to harness technology's power to improve the reading ability of students. Hence, today's teachers need to harness internet and multimedia technology in order to guide students in developing their critical literacy skills (Dell, n.d.).

With the endless possibilities provided by technology development in education, the challenge for every Filipino to be empowered and globally competitive is to increase this level of literacy. The task of preparing Filipino students to be globally literate lies in the hands of efficacious and knowledgeable teachers. This requires more than teaching students how to read and write. While educators are greatly concerned in focusing on reading skills particularly the development of vocabulary, reading comprehension, and word study, reading problems should not dampen teachers' enthusiasm to unleash within the students their optimum literacy potentials (Lontoc, 2007).

Intel World Ahead Program Education (2009) reported that tomorrow's citizens and workers deserve an education that prepares them—and their nation's economy—to thrive in a world of rapid change and widespread globalization. This education will provide the skills which include but are not limited to conducting independent research,

thinking critically, solving problems and using technology to communicate and collaborate. It is also underscored that to make this happen and make students, teachers, societies, and economies avail of the benefits, Information and Communication Technology (ICT)-enhanced learning should be adapted in schools. Hence, technology can modify how teachers teach and how students comprehend. The present major objectives of schools are not just to acquire but to perceive the effect of ICT on education and deliver its promises (Tolentino, 2001).

Meskill (2002) elucidated that more and more teachers are introducing new technologies into their classroom with the aim of enhancing their practices and student performance. However, assessment of teaching beliefs and teaching styles is not commonly done by many educators in their typical classroom setting (Edora, 2010) much more in teacher education institutions. Little, if not all, has been done to study teaching reading efficacy, technology integration, and teacher educators' modeling. Therefore, the researcher opted to investigate the nature of and the relationships that may exist among these variables.

Reading plays a major role in improving the literacy of citizens. It is a multifaceted process that students do on several levels as they move through the grades. Prior knowledge, decoding skills, and specific strategies are critical elements influencing comprehension and interpretation of texts (Al-Hazza, Fleener, & Hager, 2008). Cabaroglu and Yurdaisik (2008) posited that to understand how teachers deal with teaching reading, it is necessary to examine their beliefs and thinking processes which they put to action in the classroom. Henson (2001) forwarded the idea that a determinant of teaching behavior is a simple but powerful construct. The correlates of teacher efficacy are prevalent when using a wide array of measurements and scales. It is also confirmed that students of efficacious teachers generally do better than the students in other classes (Tschannen-Morgan & Hoy, 2001; Gowie, 2010).

Using a teaching reading belief scale, Baccus (2004) found that teachers and students showed confidence in their ability to provide reading instruction and impact student learning. Results manifested significant relationships between teachers' and students' reading attitudes and efficacy beliefs. In the local setting, Lontoc (2007) noted that the teachers of English of freshmen high school students in Batangas National High School had a wide array of teaching reading strategies. However, teaching reading practices employed by the teachers did not build reading skills required in processing complex reading tasks. Consequently, Lontoc recommends that research concerning vocabulary instruction and technology based-reading be conducted in the future. This provides a basis for the current study which covered the relationship of reading efficacy and knowledge levels of preservice teachers and technology integration in instruction.

There is very little research that addresses the extent to which preservice teachers' reading teaching efficacy and their knowledge levels for technology-enriched class. Viray (2008) recommends that preservice teachers should examine their beliefs and practices about reading and teaching reading as these are reflected in the classroom and caught by their students.

With the use of technology in all aspects of this global society, Koc (2005) in a critical review of the implications of learning theories for effective technology integration and pre-service teacher training, recommends that technology-oriented teachers' new role is to become manager of information, coach, guide, organizer, initiator and diagnostician. She stressed further that the role of imparter of knowledge and role of coach are put at both ends of a continuum. Apparently, teachers adapting the former role support the behaviorist learning theory while the latter subscribe to constructivism (Koc, 2005; Becker, 2000).

Gill and Dalgarno (2008) raised the challenge facing teacher educators on how to ensure that pre-service teachers have the necessary combination of skills and

pedagogical knowledge that will enable them to both effectively use today's technologies in the classroom as well as continue to develop and adapt to new technologies that emerge in the future. Those who have received professional development in pre-service years may not feel fully comfortable with their technology skills and knowledge; thus the feeling of unpreparedness for technology integration in teaching content becomes apparent (Ponessa, 1996 & Loveless, 1996).

Given the nature of the new literacy stirred by the influx of emerging technologies and the required skills that teachers need to develop and infuse such technologies for educational ends, Mishra and Koehler (2008) introduced the Technological Pedagogical Content Knowledge (TPCK) emanating from Shulman's (1986) Pedagogical Content Knowledge (PCK). Archambault and Crippen (2009) investigated the knowledge level of K-12 online teachers with respect to the domains described by the TPCK framework. Their findings indicate that teachers' knowledge ratings were highest among the domains of pedagogy, content, and pedagogical content but their knowledge ratings with technology domain were unfavorable. Furthermore, Chai, Koh, and Tsai (2010) examined the perceived development of preservice teachers in terms of their technological knowledge, pedagogical knowledge, content knowledge and the synthesis of such knowledge. Hence, the studies mentioned here presented initiatives toward assessing TPCK among in-service and pre-service teachers.

Riñon (2007) found out that teacher educators in a university in Bicol have some knowledge of, little competence in, and only some training on new literacy. Her study also revealed that the teachers have a negative attitude toward new literacy, manifested little confidence, and expressed fear and anxiety in its use in their instruction. In conclusion, she recommended the investigation of the teachers' knowledge by looking at its relationship with teachers' belief.

This study looked into the preservice teachers' knowledge levels in integrating technology in instruction along the TPCK framework by investigating its connections to their teaching reading efficacy beliefs.

Preparing preservice efficacious literacy teachers for ICT integration in the classrooms is beginning to become a main concern for many teacher education institutions. The findings of this study would have some implications to teacher education, specifically, in preservice teachers' training program. The data gathered would reflect on the current teacher preparation on literacy instruction underpinning the TPCK framework in integrating technology in the teaching-learning process.

In connection with this underlying framework, the researcher was motivated to investigate the pre-service teachers' perceived teaching reading efficacy, knowledge levels to integrate ICT in instruction, and teacher educators' TPCK modeling in the context of enhancing teacher preparation courses.

STATEMENT OF THE PROBLEM

This study aimed to examine the preservice teachers' reading efficacy beliefs, TPCK knowledge levels, and their perceived teacher educators' TPCK modeling. The following questions guided the study:

1. What are the teaching reading efficacy beliefs of pre-service teachers?
2. What is the perceived knowledge level of pre-service teachers in the areas of technology, pedagogy, and content, including combinations of these TPCK domains?
3. What is the extent of the teacher educators' TPCK modeling as perceived by the pre-service teachers?6

4. What is the relationship between pre-service teachers' teaching reading efficacy beliefs and their perceived TPCK levels?
5. What is the relationship between pre-service teachers' teaching reading efficacy beliefs and the perceived teacher educators' TPCK modeling?
6. What is the relationship between the pre-service teachers' TPCK levels and the teacher educators' TPCK modeling?

SIGNIFICANCE OF THE STUDY

The findings and implications of the study are beneficial to the following:

1. Administrators

Recommendations from this study will offer administrators or heads of teacher education institutions baseline information for formulating policies, planning and crafting teacher literacy preparation courses including preparation and development of instructional material related to ICT integration, investment on technological infrastructure and teacher educators and staff professional development for systemic change.

Glifonea and Mayani (2010) suggest that professional development has a significant influence on how well Information and Communication Technology (ICT) is embraced in classroom practices. It has remained commonsensical that current teachers' training program often focus more on basic literacy and less on integrated use of ICT in teaching.

2. Teachers

The in-service teachers and/or teacher educators will reflect on their confidence and effectiveness as reading teachers. The need for effective, efficient training and professional development programs on how to infuse technologies in their classrooms will be encouraged keeping in mind that technology will become a tool

not a focus of instruction. Consequently, they will become more aware of their own TPCK levels and be reflective of their teaching-learning strategies. They, too, will realize the need to adapt and/or develop instructional materials integrating technology in literacy instruction which requires confidence and high cognition.

The teachers' choice of instructional technology-enhanced teaching models depends on maintaining the shift from teacher centeredness to student centeredness in the pre-service choice of teaching methods using computers in their curriculum content areas particularly in literacy (Cyrus, 2006 & Wang, 2002).

3. Students

Students, particularly the pre-service teachers, will have an opportunity to assess their teaching reading self-efficacy and TPCK level themselves. Furthermore, preservice teachers will benefit much from their supervising or cooperating teachers and teacher educators who could appropriately and consistently demonstrate TPCK in the classrooms. Mims' (2004) inquiry study implies that preservice teachers' visions of computer integration are reflections of their own learning experiences with computer integration from their development years to the present.

4. Researchers

Researchers who understand the affordances and constraints of reading efficacy and technology integration under the roof of the TPCK framework will be more involved to conduct further studies not only on pre-service teachers but also on in-service teachers, in all their learning and career stages respectively. Studies on these two areas will be beneficial to education particularly on the field of literacy, technology integration across the curriculum content, preparation and development of instructional materials, and validation of assessment instruments germane to TPCK development of teachers. The pursuit on these metamorphosing inquiries will lead to a more relevant, timely and responsive teacher preparation program.

SCOPE AND DELIMITATION

This study investigated the pre-service teachers' teaching reading self-efficacy beliefs, TPCK levels, and their perceived teacher educators' TPCK modeling.

This research was delimited to the self-assessment of the forty-seven graduating elementary pre-service teachers who were conveniently selected because of ease in accessibility and proximity to the researcher in a teacher education institution in Lopez, Quezon.

This study covered the relationship of pre-service teachers' teaching reading efficacy, their perceived TPCK levels of which subscales or domains include Technological Knowledge (TK), Content Knowledge (CK) which is only limited to the area of literacy instruction or content rather than all the major subject areas, Pedagogical Knowledge (PK), Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and Technological Pedagogical Content Knowledge (TPCK); and the pre-service teachers' perception of their teacher educators' TPCK modeling in the classroom.

Three non-standardized assessment instruments were used in this study. Instrument 1 was utilized in investigating the pre-service teachers' teaching reading efficacy beliefs, Instrument 2 in assessing the pre-service teachers' knowledge levels or ratings along the TPCK framework, and Instrument 3 in determining the pre-service teachers' perception of their teacher educators' TPCK modeling.

Furthermore, this study is delimited by the self-perception nature of the three surveys used for pre-service teachers to respond rather than the measurement of observable behavior for the teacher educators to assess. Self-report is susceptible to a certain degree of partiality (Archambault & Crippen, 2009). To minimize or counter such biases, adapted and modified instruments were reviewed by experts and were subjected to reliability and validity measures.

CHAPTER II

REVIEW OF RELATED LITERATURE AND CONCEPTUAL FRAMEWORK

REVIEW OF RELATED LITERATURE

The discussions in this chapter are about the various constructs and concepts about teaching reading efficacy, reading instruction, and the development of teachers' knowledge in integrating technology in literacy instruction. Related literature germane to efficacy, reading instruction, technology, pedagogy, content and combinations of these areas are emphasized.

Efficacy

Bandura (1997) defines efficacy as the disposition of people about their abilities to execute control and judgments of their confidence to perform tasks. In short, it is the concept that concerns individuals' perceptions and levels of confidence. He delineated further that efficacy can be characterized as high or low and is perceived with various characteristics. His concept on self-efficacy grew from social cognitive theory which proposes the development of capabilities and the regulation of behavior. In social cognitive theory, a variety of environmental and personal internal factors, including thought processes and beliefs about one's abilities, interact and determine human actions.

Teacher Efficacy Beliefs

Perceived teacher efficacy refers to teachers' beliefs about their capabilities to support learning and motivate students (Bandura, 1997). Efficacy is tantamount to how a teacher feels about his or her ability to do his or her job; hence, it is considered as predictor of teaching effectiveness which is commonly equated with confidence (Gordon, 2001). Elaborating the concept, Tschannen-Morgan & Hoy (2001) stressed also that it is the perceived capabilities of teachers to bring about the desired outcomes of students that can engage even the struggling or unmotivated students into learning.

Bandura (1996) pointed out that efficacy beliefs result from mastery experiences, vicarious experiences, verbal persuasion, and physiological arousal. One of the ways to promote high levels of teacher efficacy is through mastery experiences, so the question lies on whether pre-service teachers training and exposure to practice teaching can develop teachers into efficacious and knowledgeable teachers as their teaching internship goes beyond and into the real phase of work in the field. Hence, a teacher's sense of efficacy may influence the classroom learning environment and student progress and performance.

The importance of personal teacher efficacy in reading and its significance to classroom literacy practices is considered a fertile ground for study. Teachers with a sense of efficacy in teaching and reading allot more attention and time to teaching comprehension, reading strategies, vocabulary, and use more authentic children's literature than less efficacious teachers do (Baccus, 2004). In the current study, the researcher aimed to build on Baccus' work by focusing on preservice teachers' teaching reading efficacy beliefs and Technological Pedagogical Content Knowledge and their underlying relationships to one another. The researcher theorizes that connections between beliefs and knowledge may exist; however, there was little or no data at all to

support such assumptions.

In examining the teachers' self-efficacy, Henson (2001), likewise, purported that a determinant of teaching behavior is a simple but powerful construct. The correlates of teacher efficacy are prevalent when using a wide array of measurements and scales. He further confirmed that students of efficacious teachers generally do better than the students in other classes. Apparently, teachers' beliefs in their classroom practices are influencing factors that can make even unmotivated students to learn (Tschannen-Morgan & Hoy, 2001; Gowie, 2010).

Preservice Teachers' Efficacy

Shultz, Neyhart, and Reck (1996) as cited in Geoghegan and others (2004) stressed the importance of understanding how teachers' beliefs, attitudes, and dispositions are interwoven with their knowledge, skills, and behaviors of classroom teaching. They all agree that the teachers' growth and confidence to teach may be considered as key factors in facilitating positive pedagogical paradigm direction. In the current study, the researcher would like to relate teaching reading efficacy, TPCK knowledge levels and teacher educators' TPCK modeling to better understand preservice teachers' development of knowledge and to enrich the literacy preparation program.

Preservice teachers' perceived efficacy will have developed as they move from beginning status through their practice teaching experiences. Being beginner-teachers, their confidence in their efficacy can decline as they find themselves unprepared to cope with the lonely effect of teaching and the political competition met in the procurement of resources. On the other hand, teachers with a strong sense of efficacy have been found to manifest greater levels of planning and organization in their work,

openness to new ideas and willingness to experiment with new teaching methods. In addition, they are more persistent in their teaching effort, less critical and more able to sustain empathy and support for their pupils (Geoghegan et al, 2004).

Graham and Thornley (2000) found that many pre-service teachers believe that their practical learning occurs in schools and tertiary institutions where construct or theory is evidently gaining emphasis. Thus, the retention of this perception throughout their preservice program may impact strongly on the likelihood of changing their pedagogical practices as they enter the in-service teaching profession. Pertinent to this research is the fact that teachers were found to assume greater responsibility for positive rather than negative student outcomes, and greater efficacy was related to high teaching ability confidence.

Geoghegan and others (2004) examined the early childhood teachers' self efficacy and teacher preparedness in facilitating children's learning of concepts in multiple contexts. The student teachers at the final year of Bachelor of Education (Early Childhood) at the University of Southern Queensland (USQ) were the participants in the study. Results showed that final-year preservice early childhood teachers had high levels of confidence for facilitating teaching and learning that incorporated a multi-modal approach to concept development. Participants also reported high confidence in their ability to develop creativity in their curriculum program, teach numeracy, literacy, multiliteracies, and reading, as well as teach children how to calculate. Geoghegan and others (2004) discreetly advised preservice teachers that in order to become successful in the teaching profession, preservice early childhood teachers must be able to reflect upon their personal theories and practices in order to reflexively generate newer theories and perspectives into their practices.

Teacher Efficacy and Reading Instruction

Baccus (2004) investigated the intermediate teachers' reading attitude and efficacy beliefs and their relationship to reading instruction and to students' reading attitudes and efficacy beliefs. Seventy seven (77) teachers and one hundred eighty-three (183) students from one large urban school were surveyed and three of the teachers were interviewed. One of the surveys used was the Reading Teaching Efficacy Belief Instrument (RTEBI), a Likert scale type survey developed by Baccus (2004) patterned from the Science Teaching Efficacy Belief Instrument by Riggs and Enoch (1990) for the purpose of measuring teachers' self-efficacy scale in reading instruction. Generally, teachers and students reported positive attitudes toward reading. Teachers also expressed confidence in their ability to provide reading instruction and impact student learning. On the other hand, students were less efficacious in their reading skills and abilities. Results manifested significant relationships between teachers' and students' reading attitudes and efficacy beliefs; hence, teachers with positive beliefs in the subject matter and their teaching ability may be more effective in using instructional practices that motivate struggling learners. In a nutshell, Baccus (2004) asserted that assisting teachers to develop favorable disposition toward teaching reading could impact student learning and teachers' professional development.

Examining teachers' beliefs in the tertiary level, Cabaroglu and Yurdaisik (2008) surveyed fifty instructors on their views about and approaches to reading instruction and interviewed six (6) of them according to the diversity of their answers to the questionnaire. They also examined how teachers read in foreign language, how they [teachers] teach reading, what problems they face in reading lessons and what strategies they use in their reading lessons. Results revealed that teachers who used reading strategies in their daily lives were more knowledgeable about reading strategies and had

a clear awareness of the reading strategies while instructing in the classroom. In addition, unfamiliar texts, lack of vocabulary, and grammar knowledge, inappropriate level of the text were the common points that the teachers reported regarding the difficulties students faced in a reading class. Instructors reported that in case of difficulties they either helped the students directly or guided them to use reading strategies. Most of the instructors thought that good reading instruction should involve strategy training. For them, the necessity of balanced pre-reading and post reading strategies should be one of the key areas that strategy training may cover.

Al-Hazza, Fleener, and Hager (2008) measured the effects of four-day professional development workshops on research-based reading instruction of one hundred and forty-one full time elementary teachers. Participants were given surveys on knowledge calibration items measuring perceived understanding of phonics, phonological awareness, and syllabication and phonics pretest. There were statistically significant differences between participants who rated their knowledge as high and those who rated their knowledge as low on the phonological and phonics items. However, teachers in this study overestimated their knowledge of phonological awareness and phonics. Teachers' overall knowledge in the areas investigated revealed a weak knowledge base. There were no significant differences between those who rated their knowledge as high compared to those who rated their knowledge as low on the subtest knowledge of syllabication. In addition, no significant differences were found between new teachers and experienced teachers in their knowledge in the three domains.

Through the use of calibration methodology, teachers' perception of their knowledge has given the researchers a window to redesign the professional development experiences for experienced teachers as well as for preservice training. If

teachers have false perceptions concerning their knowledge of basic components of reading, they may naively misrepresent both phonemes and morphemes in their instruction causing confusion among students. An interesting finding was that 48% of the participants felt that phonics was the most important skill required for effective reading; however they had not mastered the terminology or the phonetic principles to adequately instruct children in these skills (Al-Hazza, Fleener, & Hager, 2008).

In the local setting, Lontoc (2007) conducted a case study on the teaching practices that address the reading comprehension needs of selected first year high school students of Batangas National High School. She found that the teachers of English of freshmen high school students in Batangas NHS have a wide array of teaching reading strategies. These strategies were contextual processing, experience-text-relationship, question- answer-relationship, Readers Theater, role playing, SQ3R, story maps, and the use of graphic organizers. Classroom observations further showed that activities done in session focused on the mastery of the text content. The assessment procedures used also involved activities which dealt dominantly on simple recall of the details in the text content. Thus, teaching reading practices employed did not build reading skills required in processing complex reading tasks. Lontoc recommends that research concerning vocabulary instruction and technology based-reading also be conducted in the future. Thus, this current study would like to investigate the connection of reading efficacy and technology knowledge levels.

Viray (2008) examined the Developmental Reading (DR) teachers' beliefs and practices regarding reading and reading instruction and then developed a new design for the DR course offered in Tertiary Education Institutions under the umbrella of Whole Language. The redesigned DR program was tried out in the main campus and the nine Extramural studies Centers of the Palawan State University in the first

semester of school year 2003-2004, after which the beliefs and practices were again examined using a survey questionnaire. Thirteen (13) teachers who were found to have implemented the program participated in the focus group discussion intended to assess if the program had made substantial impact. Results of the instrumentations showed that majority of the respondents believed that teaching reading is difficult. Before the program implementation, majority viewed teaching reading as boring and monotonous. Most of the beliefs and practices were found not to be reflective of the whole language perspective. With the redesigned DR program, the boredom and monotony could be lessened if not totally eliminated. Viray recommended that further studies on teachers' beliefs and practices be made not only in the area of reading instruction but also in other content areas to improve instruction.

Edora (2010) investigated the associations between teaching beliefs and teaching styles of teachers across teaching levels - primary, intermediate and secondary - from different public schools. Based on her study, she classified teaching beliefs under behaviorist, cognitivist, humanist, and eclectic. Using adapted instruments, she described and measured the degree of associations between variables. Survey questionnaires were administered to 203 teachers from seven elementary and three secondary schools. Results showed that primary teachers are mainly eclectics, intermediate level teachers are primarily humanists, and the secondary teachers are chiefly cognitivists. There is no association between teaching levels and teaching styles and no significant association existed between teaching beliefs. Like Viray (2008), Edora (2010) commented that correlation between teaching beliefs and subject matter being taught would reveal more specific results about the effects of different subjects on teachers' beliefs about teaching. Hence, this study would like to investigate on the literacy content knowledge level relation with the teaching reading efficacy beliefs of

pre-service teachers and teacher educators' TPCK modeling.

Knowledge

It is interesting to note how the construct of knowledge has intrigued many researchers in the field (Shulman, 1986). Educators and policy makers have conducted investigations on the knowledge of teachers in a large scale.

Shulman (1986) introduced a specialized body of knowledge which he coined 'Pedagogical Content Knowledge'. This construct comprises of content knowledge, general pedagogical knowledge, curriculum knowledge, pedagogical content knowledge, knowledge of learners and their characteristics, knowledge of educational contexts, knowledge of educational ends, purposes, and values and their philosophical and historical grounds. On one hand, Grossman and Richert (1988) identified the characteristics of the necessary knowledge needed for those involved in teaching. The researchers explained teacher knowledge as follows: "a body of professional knowledge that encompasses both knowledge of general pedagogical principles and skills and knowledge of the subject matter to be taught" (p. 54). With these two initial assumptions, it is obvious that understanding and formulating teachers' knowledge has become a fertile variable or factor for educational research.

TPCK Framework

Mishra and Koehler (2008) proposed the Technological Pedagogical Content Knowledge (TPACK or TPCK) as a way of thinking about the knowledge teachers need to understand to integrate technology effectively in their classrooms. They argue that TPCK includes knowledge of content, pedagogy, and technology, as well as

understanding the complex interaction among these knowledge components. As Schmidt et al (2009) described in their development and validation of an assessment instrument for preservice teachers, TPCK was introduced to the educational research field as a theoretical framework for comprehending teacher knowledge required for effective technology integration (Mishra & Koehler, 2006).

The TPCK Framework grows from Shulman's (1986) idea of Pedagogical Content Knowledge (PCK) which consists of a crucial aspect of teacher's knowledge on their subject matter and their knowledge of the particular form of content teachability. Pedagogical Content Knowledge also covers the understanding of what makes the learning of a specific topic or area simple or complicated.

Even though the TPCK construct is a novel approach to ICT knowledge integration, the idea has intrigued experts with its various equivalent names as they continue to define the characteristics, skills and knowledge of teachers who could drive the complexities, advantages and connections of its domains (Schmidt et al, 2009). Mishra and Koehler (2006; 2008) argued that at the helm of good teaching are three core components: namely, Content, Pedagogy and Technology. To identify the relationship of these three is to understand the interactions, between and among these elements, working out distinctively within varied contexts of which definition lies under the realm of instructional technology integration. Within the components' meeting point is a perceived understanding of content with appropriate teaching methodologies and emerging technologies (See Figure 1).

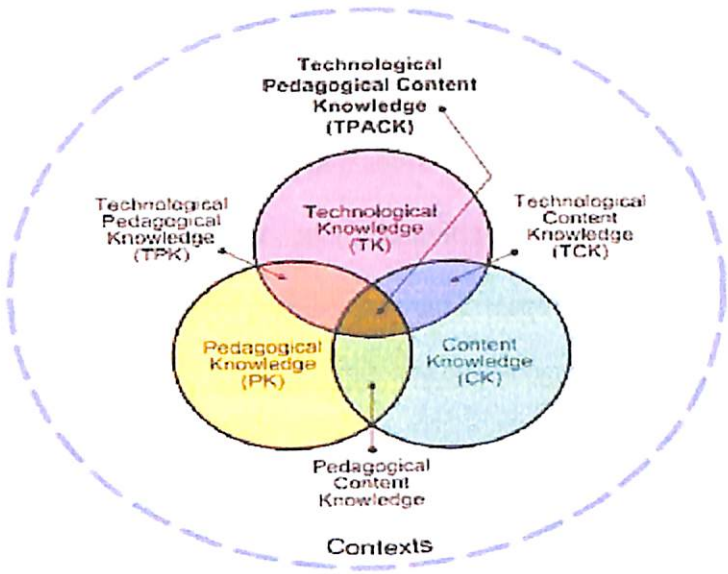

Figure 1: The components of the TPCK framework (Image from tpack.org)

Components of TPCK

To picture the TPCK framework clearly the seven (7) components are defined by Shulman (1986), Schmidt et al (2009), Mishra and Koehler (2006, 2008) and as elaborated by Cox and Graham (2009) :

1. **Pedagogical Knowledge (PK):** Pedagogical Knowledge covers the methods and processes of teaching and knowledge in classroom management, assessment, lesson plan development, and student learning.
2. **Content Knowledge (CK):** Content Knowledge is the knowledge of the subject matter itself. In an elaborated approach, it is simplified to indicate a knowledge of the possible topic-specific representations in a given subject area. These representations might include models of electron flow in science, graphs of data in mathematics, or timelines in social studies.

3. **Pedagogical Content Knowledge (PCK):** Pedagogical Content Knowledge as conceived by Shulman (1986) refers to the content knowledge that deals with the teaching process. In an elaborated style, this knowledge is divided into knowledge of subject-specific activities and topic-specific representations. For instance, the use of primary sources in teaching history content shows a topic-specific activity. Likewise, it is also knowledge of creating an opportunity for students to grasp specific concepts.

4. **Technological Knowledge (TK):** Technology knowledge is the knowledge about various technologies, ranging from low-tech technologies to digital technologies. In the elaborated style, technological knowledge is defined as knowledge of how to use emerging technologies. The definition is limited to emerging technologies in order to illustrate the distinction between TPCK and PCK.

5. **Technological Content Knowledge (TCK):** Technological Content Knowledge refers to the knowledge on how technology can create new representations for specific content. It suggests that teachers understand that, by using a specific technology, they can change the way learners practice and understand concepts in a specific content area. In the elaborated model of TPCK, TCK refers to knowledge of the topic-specific representations in a given content domain that utilize emerging technologies. The knowledge of these representations exists independent of knowledge about their use in a pedagogical context. As the technologies used in the representations become ordinary, that knowledge is transformed into content knowledge. For instance, scientific calculators were once considered emerging technologies in mathematics, but knowledge of how they facilitate mathematical representations is now part of the content of

mathematics itself.

6. **Technological Pedagogical Knowledge (TPK):** In the elaborated model, TPK is knowledge of the general pedagogical activities that a teacher can engage in using emerging technologies. Thus, TPK may include knowledge of how to motivate students using technology or how to engage students in cooperative learning using technology. Again, these activities are independent of a specific content or topic not because they do not involve content, but because they can be used in any content domain. As the technologies being used become transparent or ubiquitous, TPK transforms into pedagogical knowledge as the emphasis on the technology is no longer needed. For example, while the overhead projector was once considered a new tool that could be used in the classroom to facilitate presentation, it is now a mainstream in teaching. However, interactive whiteboards or online pads, which utilize digital projectors and allow the teacher and students to interact with projected content, are considered emerging technologies and are not yet ever- present in the classroom.

7. **Technological Pedagogical Content Knowledge (TPCK):** Technological pedagogical content knowledge refers to the knowledge required by teachers for integrating technology into their teaching in any content area. Teachers have inferential understanding of the complex interplay between the three basic components of knowledge (CK, PK, TK) by teaching content using appropriate methods and technologies. Based on the elaborated model of the framework, TPCK refers to a teacher's knowledge of how to coordinate the use of subject-specific activities or topic-specific activities with topic-specific representations using emerging technologies to facilitate student learning. As the technologies used in those activities and representations become ubiquitous, TPCK

transforms into PCK. For example, a teacher may know how to conduct a frog dissection with her students as part of inquiry-based learning in the classroom. Alternatively, one may know how to use an online dissection simulator with his or her students as part of inquiry-based learning in the form of a WebQuest. Knowledge of how to use the online simulator as part of one's subject specific activities is TPACK, while knowledge of how to conduct a traditional dissection with transparent technologies such as scalpels, paper diagrams, etc., is PCK.

TPCK application in the classroom requires a profound, sensible, and fine understanding of teaching with technology and the other domains. It must be fathomed that the separation of teaching into content, pedagogy and technology is not necessarily straightforward, or even something that good teachers do. To attain the so-called *dynamic equilibrium*, integration should work well (Mishra & Koehler, 2008); otherwise compensatory characteristic of each component should address any conflict or constraints within the framework (Mishra & Koehler, 2006).

In today's technology-infused classrooms, it is within the realms of teacher educators, in-service teachers, and pre-service teachers to explore and address effective practices using technology to enhance learning. By understanding the TPCK framework in the field, pre-service teachers may discern using ICT for classroom teaching as an act of integrating TK, PK and CK to form TPCK for a particular lesson (Lock & Redmond, 2010).

Since this study was anchored on the TPCK framework in assessing the teachers' competence in integrating ICT in instruction, pre-service teachers' self assessment of their knowledge level could be related to their teaching reading efficacy beliefs, and TPCK modeling of their teacher educators, teacher preparation program and,

computers will take the lead.

Couros (2002) provides model integration at a teacher education dubbed as ITEACHER PROJECT. His action research at the University of Regina described the initial success of developing, implementing, facilitating, and exploring the appropriate integration of information and communications technology (ICT) into key components of the Faculty's undergraduate teacher education program and more specifically, into the professional practice of pre-service teachers, faculty members, and cooperating teachers in the field.

Pre-service teachers' levels of technology use are influenced by their lack of self-confidence in their ability to use technology in instruction (Albion, 1996). Furthermore, Albion put forward that the most significant factor influencing student teachers' use of computers with children was found to be the cooperating teachers' use of computers with children. More than a decade after, Jong (2010) validated how supervising teachers could become effective models for technology integration considering the Technological, Pedagogical, and Content Knowledge development of preservice teachers. He concludes that observing experienced science teachers helps pre-service teachers imitate and apply instructional strategies and use of emerging technologies (computer, video, film...) in their teaching. A pre-service teacher noted in an interview "I created a multimedia video-recording to illustrate the concept of density and its applications." (p.139). This idea was inspired by the observation through a mentor teacher's teaching. This only proves that supervising or cooperating teachers have their fair share in developing innovative teachers.

Whetstone and Carr-Chellman (2001) found that computers were considered important to education; however, pre-service teachers did not appear to see the importance of their own pedagogical roles in integrating computers in classrooms at the

onset. They showed concern and a lack of enthusiasm toward the use of computers, in spite of the importance they placed on computers in changing schools. On the other hand, teacher educators providing pre-service teachers the opportunity to reflect on and evaluate their knowledge of computer integration and sound ICT- enhanced learning experience could lead pre-service teachers to self-identify their conflicting ideas; thus it could result in the development of deeper and more thoughtful insights, models and practices concerning computer integration (Mims, 2004).

As teacher education improves, change in pre-service teachers' use of technology is inevitable. Albion (2003) described in his study on the graduating teachers' disposition toward teaching with ICT at University of Southern Queensland. It could be concluded that, compared to their predecessors, 2003 graduating teachers at the University of Southern Queensland are better prepared for, and more positively disposed towards integrating ICTs into their teaching. Nonetheless, a follow-up study is needed to see how far those improved characteristics played out in the classroom where the teachers are. Furthermore, whether the observed differences are a consequence of changes made to the teacher preparation program or are related to the arrival of a new generation of ICT natives is not known with certainty so far. Further studies of students entering the teacher preparation programs may help to answer that question (Albion, 2003).

To answer the call of Albion, Mims (2004) investigated qualitatively the beginning pre-service teachers' perceptions of computer integration. He found out that beginning preservice teachers' perceptions in their integration of computers with the processes of teaching and learning are naïve and demonstrated very little development. The participants' responses were often repetitive and lacked depth. In fact, the individuals interviewed in the study sometimes made contradictory statements

about their perceptions of integrating computers with teaching and learning. This is similar to the present study with regard to describing teacher's knowledge on ICT integration, but the focus is not on the beginning but rather on the graduating elementary pre-service teachers.

Mayani (2009) studied the effectiveness and efficacy of information and communication technology in the pre-service training of a higher institution in Quezon. The study suggests that teachers and students use ICT tools mainly for data storage, motivation, and presentation with word processing as its key program. It further reveals that teachers and students commonly utilized internet searching and office skill demonstrations which are significant in the enrichment of student learning. ICT tools are very effective in achieving lesson objectives, motivating students, and making the class discussion more interesting and interactive. More and more experts justified that lack of continuing professional development in ICT and minimum resources are apparently the common problems being encountered in ICT integration. Similarly, integration of ICT in all subject areas in teacher institutions as well is recommended (Mayani, 2009; Mims, 2004).

As education institutions continue to recognize the pivotal role of educational technology in preparing student teachers or teacher candidates for their future classroom works, Mishra and Koehler (2008) proposed a framework that underpins the knowledge needed by teachers to integrate appropriately technology in content and teaching practices. They introduce the TPCK, emanating from Shulman's PCK, as a way of thinking about the knowledge teachers need to understand in order to integrate technology effectively in their classrooms.

Looking into a beginning approach to measure TPCK level of teachers, Archambault and Crippen (2009) investigated the knowledge level of K-12 online

teachers with respect to the domains described by the TPCK frameworks. The result of the online self-assessment survey which they employed indicates that teachers' knowledge ratings are highest among the domains of pedagogy, content, and pedagogical content showing that the responding online teachers felt very good about the said domains but they were less confident when it comes to technology. Although there revealed a weak correlation between technology and pedagogy, as well as technology and content (.289 and .323, respectively), there was a large correlation between pedagogy and content (.690).

Delving into the distinctiveness of the TPCK domains, Schmidt et al (2009) further developed and validated a Likert-type instrument designed to measure pre-service teachers' self-assessment of their TPCK and related knowledge domains included in the framework. The instrument was piloted on 124 elementary preservice teachers. High Cronbach alpha of 0.80 were obtained for each TPCK constructs. Hence, the survey is a reliable and valid instrument that will help educators design longitudinal studies to assess pre-service teachers' development of TPCK.

Adapting the questionnaire developed by Schmidt et al (2009), Chai, Koh, and Tsai (2010) examined the perceived development of pre-service teachers in terms of their technological knowledge, pedagogical knowledge, content knowledge and the synthesis of such knowledge. Factor analyses and the 889 preservice teachers' TPCK perceptions before and after their ICT course were examined in Singapore. Results reveal that technological knowledge and pedagogical knowledge are all significant predictors of preservice teachers TPCK, with pedagogical knowledge having the largest impact. In general, the literature presented initiatives toward assessing TPCK among in-service and pre-service teachers.

Teacher preparation programs necessitate providing preservice teachers with a

variety of effective experiences in literacy with computer integration that can be adopted for use in their future classrooms. Purposeful efforts should be made to encourage preservice teachers to frequently reflect on and evaluate their perceptions about technology integration in the classroom (Mims, 2004). Hence, the nature and composition of teacher preparation and training programs do impact considerably on pre-service teachers' knowledge, beliefs and attitudes, and consequently their preparedness to use ICTs in classrooms (Gill & Dalgarno, 2008). Considering the aforementioned review of literature and the need to conduct deeper investigation, this study aimed to answer the pre-service teachers' teaching reading efficacy beliefs, knowledge levels, and models to integrate technology in instruction along the TPCK framework.

Summary

Teacher efficacy refers to teachers' beliefs or feelings about their capabilities to support learning and motivate students; hence, it is considered a predictor of teaching effectiveness commonly equated with confidence (Bandura, 1997; Gordon, 2001).

Bandura (1996) stressed that efficacy beliefs result from mastery experiences, vicarious experiences, verbal persuasion, and physiological arousal. In addition, the importance of personal teacher efficacy in reading and its significance to classroom literacy practices are considered a fertile ground for study. Teachers with a sense of efficacy in teaching and reading allot more attention and time to teaching comprehension, reading strategies, and vocabulary, and use more authentic children's literature than less efficacious teachers do (Baccus, 2004). Hence, teachers' beliefs in their classroom practices are influencing factors that can make even those unmotivated students to learn (Tschannen-Morgan & Hoy, 2001; Gowie, 2010).

Significant relationships exist between teachers' and students' reading attitudes and efficacy beliefs; consequently, teachers with positive beliefs in the subject matter and their teaching ability may be more effective in using instructional practices that motivate struggling learners (Baccus , 2004). On one hand, Viray (2008) recommended that further studies on teacher beliefs and practices should be made not only in the area of reading instruction but also in other areas as well to improve instruction; thus this study looked into the realm of teachers' efficacy in literacy instruction and knowledge level.

Mishra and Koehler (2008) proposed TPCK as a way of thinking about the knowledge teachers need to understand to integrate technology effectively in their classrooms. At the helm of good teaching are three core components: namely, Content, Pedagogy and Technology. To identify the relationship of these three is to understand the interactions, between and among these elements, working out distinctively within varied contexts of which definition lies under the realm of instructional technology integration.

By understanding the TPCK framework in the field, pre-service teachers may discriminate using ICT for classroom teaching as an act of integrating TK, PK and CK to form TPCK for a particular lesson (Lock & Redmond, 2010). In addition, Jong (2010) validated how supervising teachers could become effective TPCK model. Technology integration considering the TPCK development of pre-service teachers needed to be verified and/or be correlated with pre-service teachers' efficacy beliefs and their teacher educators' modeling. In a nut shell, the TPCK framework scaffolds the constructs on the research variables in this related literature. The relationship between perceived teaching reading confidence, TPCK levels, and perceived teacher educators' TPCK modeling, if any, would have to be tested.

CONCEPTUAL FRAMEWORK

Many teacher preparation programs are failing to provide pre-service teachers with the knowledge, skills, and dispositions necessary to adapt and utilize technology effectively (Marino, Sameshima, & Beecher, 2009). The TPCK framework by Mishra and Khoeler (2006, 2008) served as the scaffold of this study. Angeli and Valanides (2008) have suggested that TPACK is what enables teachers to use their knowledge about technology, pedagogy, content, learners, and context to provide transformative teaching and learning experiences. On the other hand, Mishra and Koehler (2006) described TPCK as support to recognize the important components of teacher knowledge that are germane to the sound fusion of technology in education.

With such framework, it is conceptualized that pre-service teachers who have confidence in reading instruction and/or who have experienced very favorable TPCK modeling in the classroom and/or during their practice teaching manifest very good level of TPCK to integrate technology in instruction. Meanwhile, pre-service teachers who reported lack of confidence in teaching reading and/or who have experienced not so favorable TPCK modeling in the classroom and/or during their practice teaching yield less confidence or low level of TPCK.

The researcher further claimed through its conceptual paradigm that the pre-service teachers TPCK levels are considerably influenced by the scale/s of reading self-efficacy beliefs and/or teacher' educators TPCK modeling as perceived by the pre-service teachers themselves. Hence, the conceptual framework (see Figure 2) illustrates also the connection that may be existing between efficacy beliefs and TPCK modeling in relation to pre-service teachers TPCK levels.

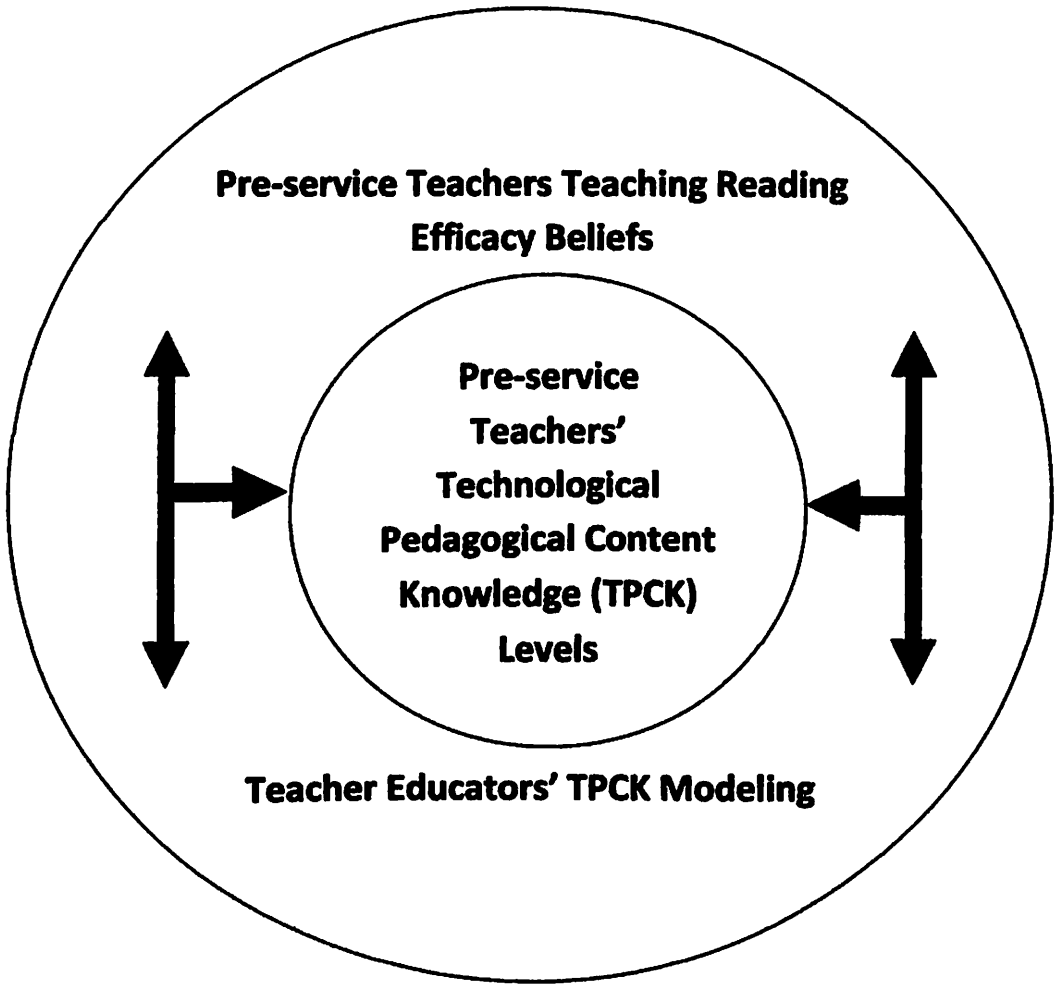

Figure 2. Conceptual Framework

Based on the questions that this study aimed to answer, the following assumptions and hypotheses are formulated:

ASSUMPTIONS

1. The pre-service teachers show to a certain extent teaching reading confidence and TPCK levels.
2. The pre-service teachers show favorable levels of TPCK in relation to their perceived teaching reading efficacy beliefs and/or teacher educators' TPCK modeling.

HYPOTHESES

The following hypotheses were drawn:

1. There is no significant relationship between pre-service teachers' teaching reading efficacy beliefs and their perceived TPCK levels based on the following scales:
   - 1.1 Technology Knowledge (TK);
   - 1.2 Content Knowledge (CK);
   - 1.3 Pedagogical Knowledge (PK);
   - 1.4 Pedagogical Content Knowledge (PCK);
   - 1.5 Technological Content Knowledge (TCK);
   - 1.6 Technological Pedagogical Knowledge (TPK); and
   - 1.7 Technological Pedagogical Content Knowledge (TPCK)

2. There is no significant relationship between pre-service teachers' teaching reading efficacy beliefs and their perceived teacher educators' TPCK modeling as shown by:
   - 2.1 Literacy Education Professors;
   - 2.2 Instructional Technology Professors;
   - 2.3 Education Foundation Professors;
   - 2.4 Professors Outside Literacy Education; and
   - 2.5 Grade 1 to 6 Cooperating Teachers

2. There is no significant relationship between pre-service teachers' TPCK levels and their perceived teacher educators' TPCK modeling.

DEFINITION OF TERMS

For clarity and common understanding, the following terms are defined accordingly.

Pre-service Teachers. This is generally defined as students taking education career courses in a teacher education institution. In this study, they are the graduating elementary student teachers who have completed the methods, foundation, and content of elementary education curriculum including the practice teaching immersion required by their programs.

Perceived Efficacy Beliefs. This refers to teachers' beliefs or feelings about their capabilities to support learning and motivate students considered as predictor of teaching effectiveness which is commonly equated with confidence (Bandura, 1997; Gordon, 2001).

In this study this refers to the respondents' overall mean of 1.76 to 3.25 as revealed in the responses in Instrument 1, Personal Efficacy Belief Scale for Teaching Reading.

Teacher Educators' Modeling. It is the teacher educators, faculty or educators' TPCK application in a teacher training institution or school environment as well as the support given by supervising teachers in practice teaching experience. (Schimdt et al., 2009).

As defined in this study, it refers to the overall mean of 3.25 to 4.00 as the weighted mean of the pre-service teachers' responses in their 3-item teacher educators' TPCK modeling scale for each of the 5 categories or subscales in Instrument 3.

Pedagogical Knowledge. This is simply the teacher's knowledge of the general pedagogical activities that she/he might utilize in the classroom, lesson planning and student learning development (Mishra & Koehler, 2006; & Cox & Graham, 2009).

It is operationally defined in this study as the pre-service teachers' knowledge as determined by an overall mean of 3.25 to 4.00 of the Pedagogical Knowledge Scale or domain in Instrument 2 Likert type items 13 to 19.

Content Knowledge. It is the knowledge of the possible topic-specific representations in a given subject area which is independent of pedagogical activities (Mishra & Koehler, 2006; & Cox & Graham, 2009).

In this study this refers to the respondents' knowledge as indicated by an overall mean of 3.25 to 4.00 of the Content Knowledge Scale in Instrument 2 Likert type items 6 to 12 focusing on the literacy foundational knowledge of reading professionals.

Pedagogical Content Knowledge . It is the knowledge that combines knowledge of activities (or strategies) and knowledge of representations in order to facilitate student learning (Mishra & Koehler, 2006; & Cox & Graham, 2009).

It is defined in this study as the pre-service teachers' knowledge as determined by an overall mean of 3.25 to 4.00 of the Pedagogical Content Knowledge scale in Instrument 2 Likert type items 20 to 24.

Technological Knowledge. This knowledge is defined as knowledge of how to use emerging technologies. The definition is limited to emerging technologies in order to illustrate the distinction between TPCK and PCK (Mishra & Koehler, 2006; & Cox & Graham, 2009).

In this study this refers to the respondents' knowledge as indicated by an overall mean of 3.25 to 4.00 of the Technological Knowledge Scale in Instrument 2 Likert type items 1 to 5.

Technological Content Knowledge. This refers to knowledge of the topic-specific representations in a given content domain that utilize emerging technologies (Cox & Graham, 2009).

It is operationally defined in this study as the pre-service teachers' knowledge as determined by an overall mean of 3.25 to 4.00 of the Technological Content Knowledge Scale in Instrument 2 Likert type items 25 to 28.

Technological Pedagogical Knowledge. Technological Pedagogical Knowledge is the knowledge about how the various technologies can be used in teaching with an understanding that using technology may change the way teachers teach (Mishra & Koehler, 2006).

In this study this refers to the respondents' knowledge as indicated by an overall mean of 3.25 to 4.00 of the Technological Pedagogical Knowledge Scale in Instrument 2 Likert type items 29 to 32.

Technological Pedagogical and Content Knowledge. Koehler and Mishra (2006) describe it as a theoretical framework of teacher knowledge for technology integration which builds on Shulman's (1986) Pedagogical Content Knowledge (PCK).

It is operationally defined in this study as the pre-service teachers' knowledge as determined by an overall mean of 3.25 to 4.00 of the Technological Pedagogical Content Knowledge Scale in Instrument 2 Likert type items 33 to 36.

LIST OF ABBREVIATIONS AND ACRONYMS

To provide brevity and consistency of word usage within the context of this study—particularly in the methodology, presentation and analysis of data, and summary and conclusion sections—the following meaning of abbreviations and/or acronyms are used:

BEED	-	Bachelor of Elementary Education
CK	-	Content Knowledge
IRA	-	International Reading Association
PK	-	Pedagogical Knowledge
PNU	-	Philippine Normal University
PCK	-	Pedagogical Content Knowledge
TK	-	Technological Knowledge
TCK	-	Technological Content Knowledge
TPK	-	Technological Pedagogical Knowledge
TPCK	-	Technological Pedagogical and Content Knowledge
RTEBI	-	Reading Teaching Efficacy Belief Instrument

CHAPTER III

METHODOLOGY

This chapter explains the research design, the sample, the research locale and the instruments used. It also presents the methods taken in the development of instruments including how the items or scales were constructed and tested for validity and reliability and the steps for analysis of the data.

RESEARCH DESIGN

The research utilized the descriptive survey method with focus on the quantitative collection and analysis of data to help the researcher avoid bias in gathering and presenting research data. The descriptive survey is generally the most suitable method to use in this investigation because this method treats information collected from a group of people in order to describe some aspects of characteristics which include but are not limited to their abilities, opinions, attitudes, beliefs, and/or knowledge of the population. In the process, a sample of a population may be surveyed depending on the access of the researcher (Fraenkel & Wallen, 2007).

Specifically, this method evaluates the knowledge of the subjects to respond toward a set of statements that demonstrates their beliefs and knowledge by showing their perception whether to respond favorably or not to the variables of this study (Wiersma, 1995). In addition, adapting, constructing and modifying expert-validated Likert scale based survey instruments were done. The survey items covered several components which were teaching reading efficacy beliefs, knowledge levels along the Technological Pedagogical Content Knowledge framework and the TPCK modeling of their teacher educators. It should be made clear, however, that the attitudinal scale

instruments in the study aimed to measure the aforementioned variables, not the pre-service attitude toward the framework. It should also be noted that this method may be used to measure teachers' perception of a program (Wiersma, 1995). Thus, the survey included respondents' perception of teacher educators' TPCK modeling. Furthermore, this research also examined the relationship of a scale or subscales in a survey to other, or of score based on another set of scale. For that purpose, correlation research is commonly paired in a descriptive survey method as well as in this study (Fraenkel & Wallen, 2007).

SAMPLE

The Philippine Normal University pre-service teachers of Lopez, Quezon are the subjects of the study. The respondents are primarily the elementary pre-service teachers with a total of one hundred fifty-seven (157) graduating students of 2012 composed of 25 males and 132 females. In order to answer the research questions, a total of fifty (50) pre-service teacher samples were asked to participate in the main study. Simple random sampling was made for the selection of the sample. This sampling method is done where each member of a population has an equal chance to become part of the sample; this is considered to be the most efficient sampling procedure. For this procedure, the lottery sampling or the fish bowl technique was utilized. Numbers were assigned for the pre-service teachers in the list. These numbers were marked on pieces of paper and drawn from a bowl; the procedure was repeated until the target sample size was completed (Schutt, 2006). For the purpose of pilot testing, another ten (10) pre-service teachers were drawn and invited to participate. Finally, the remaining members of the population composed of ninety-seven (97) respondents were selected to become participants of the field testing before the actual

administration to the sample, thus heeding the research panel's recommendation.

RESEARCH LOCALE

This study was conducted at The Philippine Normal University (PNU) Quezon Campus, an Extension Campus of PNU Manila. It is located in the town of Lopez in the Fourth District of Quezon Province. It began its operation as a teacher-training institution in this part of the Southern Tagalong Region in 1980, in partnership with the Polytechnic University of the Philippines (PUP-PNC Consortium). The contract of agreement between the two state universities expired in 1993, thus paving the way for the establishment of PNU-Quezon as the fifth PNU external campus at Brgy. Magsaysay, Lopez, Quezon.

Since then, its physical plant and facilities have continued to grow with the addition of a 5-room multipurpose building, two-storey-10-room Raffy Nantes building and the construction of a gymnasium. The computer laboratory room which is housed in the main building has 20 functional computer units with internet connection for instruction and office use. This laboratory is used for ICT-related courses and is maintained by two personnel, one of which is a computer engineer and the other, a regular instructor. Presently, PNU-Quezon has about 800 students, 25 faculty, and 10 staff members. It offers baccalaureate degrees in elementary and secondary education and graduate programs relevant to the training of teachers, school managers, and other educational specialists. The university provides educational opportunities to students coming from different areas such as Bondoc Peninsula, Bicol Region, and other outlying towns in the province.

INSTRUMENTS

In this study, three (3) instruments were used to investigate the following variables: pre-service teachers' personal efficacy beliefs for teaching reading; pre-service teachers' perceived levels of TPCK which includes TK, CK, PK, PCK, TCK, TPK, and TPCK scales; and the pre-service teachers' perception of their teacher educators' TPCK modeling.

In general, the researcher developed three self-report Likert-type questionnaires by adapting and modifying the instruments used in the related literature, by constituting experts' panel composed of two (2) knowledgeable literacy experts and one (1) research professor to review the draft instruments, by piloting and field testing them to a parallel group, by obtaining their consistency index and by revising the instruments based on the results of the review, pilot and field testing, and statistical measures. Details of the procedures are explained in the subsequent pages.

Instrument 1 – Personal Efficacy Belief Scale for Teaching Reading

This 11-item Likert type multiple questionnaire (Appendix A) was used to determine the perceived teaching reading self-efficacy beliefs of pre-service teachers in reading instruction. Nine (9) items from the questionnaire were taken and modified from the Reading Teaching Efficacy Belief Instrument (RTEBI) by Baccus (2004). However, the researcher with the guidance of the experts' validation revised some of the items and two (2) items were added after considering the review of literature.

The instrument's items were reviewed by experts according to their suitability and completeness. Based on feedback from the experts, several changes were made to the instrument. In particular, more positive sentences were used in the questionnaire rather than the negative ones. In sums, the researcher rephrased eight statements into

positive against seven negatively set statements for the Personal Efficacy Belief Scale for Teaching Reading (Instrument 1).

After considering the result of pilot and field-testing, the fifteen items in the original instrument were reduced to eleven items. This remediation was done to increase the reliability of the instrument. Positive statements were indicated in items 2, 3, 4, 8, 10, and 11 while negatively worded statements were found in items 1, 5, 6, 7, and 9.

In addition, 4-point Likert was used discarding the uncertain option in the original 5-point Likert scale instrument. Neutral or middle category response was excluded to force the respondents in expressing a stand for each statement (Siniscalco & Auriat, 2005). To interpret the results of the mean score in this instrument, the scale based on (n-1/n) that was followed was:

3.25 to 4.00 - very high confidence,

2.50 to 3.24 - high confidence,

1.75 to 2.49 - some confidence, and

1.00 to 1.74 - little confidence.

Instrument 2- Pre-service Teachers' Self Perception of Technological Pedagogical and Content Knowledge (TPCK) Levels

In this instrument, majority of the survey questionnaire items were adapted and revised from Schmidt et al. (2009) combined with the content constructs from the IRA Standards for Reading Professionals (2010), Rifion's (2007) Self Perception of Attitude towards New Literacy and Archambault & Crippen's (2009) instrument. Based on the result of experts' validation, the items and their formatting were modified accordingly.

This 36-item survey (Appendix B) was used to investigate the pre-service

teachers' perceived levels of TPCK which includes TK, CK, PK, PCK, TCK, TPK, and TPCK scales. Although Schmidt et al. (2009) items were adapted, the format of the Likert type multiple options were based on the parallel survey instrument designed by Archambault & Crippen (2009).

Schmidt et al. (2009) specifically designed the assessment instrument for preservice teachers majoring in elementary or childhood education, and it focused on the content areas such as literacy, mathematics, science and social studies. However, the focus of this study involved only the literacy content. The scales or domains of TPCK in this study are described as follows:

Technological Knowledge

The TK component of the survey investigated the pre-service teachers' understanding on how to use various technologies. The Likert type items 1 to 5 described the self assessment of their technology knowledge. "My knowledge in solving my own technical problem" is one of the items.

Content Knowledge

The second domain or component pertains to the knowledge teachers must know about literacy content. The Likert type items 6 to 12 described the self assessment of their literacy content knowledge based on the IRA Standards for Reading Professionals (2010). "My knowledge in using different strategies to develop my understanding of literacy" is part of the items in this scale.

Pedagogical Knowledge

The third domain covers the methods and processes of teaching and included fundamental knowledge in areas such as classroom management, assessment, lesson planning, and student learning. Likert type items 13 to 19 encapsulated such knowledge. "My knowledge in monitoring student

performance in a classroom" is one of the items.

Pedagogical Content Knowledge

The PCK, the fourth knowledge component, is the content knowledge that deals with the teaching process. Likert type items 20 to 24 measured pre-service teachers' PCK. "My knowledge in designing integrated, comprehensive, and balanced literacy lesson plans" is included in the items under this domain.

Technological Content Knowledge

Technological Content Knowledge is about pre-service teachers' understanding of how using a specific technology can change the way learners understand and practice concepts in a specific content. Likert type items 25 to 28 covered the understanding of pre-service teachers' TCK. "My knowledge in identifying technologies to teach literacy" is one item under this scale.

Technological Pedagogical Knowledge

The TPK refers to teachers' knowledge of how various technologies can be used in teaching and understanding that using technology may change the way an individual teaches. Likert type items 29 to 32 described the understanding of preservice teachers' TPK. "My knowledge in using technologies that enhance the teaching and learning process" is one of the items in this domain.

Technological Pedagogical Content Knowledge

The seventh and final knowledge, Technological Pedagogical Content Knowledge (TPCK), refers to the knowledge teachers require for integrating technology into their teaching—the total package. Likert type items 33 to 36 covered the preservice teachers' understanding about the interaction of the three basic components of knowledge (CK, PK, TK) by teaching content using appropriate pedagogical methods and technologies. "My knowledge in teaching

lessons that appropriately combine literacy, technologies, and teaching approaches" is part of the items in this scale.

At the onset, 38 items in Instrument 2 were categorized into seven subscales adhering to the TPCK theoretical framework by Mishra and Koehler (2008), elaborated definition of TPCK by Cox and Graham (2009) and other constructs from Chapter 2. For the TK and PK scales, items were based on the instrument developed by Schmidt et al (2009). All the seven items under CK were taken from the IRA Standards for Reading Professionals (2010) in the domain of foundation knowledge. Schmidt et al (2009) recommended that items be added on specific content and scale in their instrument to increase its validity. Thus, additional items focusing on literacy were included by the researcher. Nonetheless, the 38 items were decreased to 36 items in accordance to the expert panel's review.

And for the remaining scales—PCK , TCK, TPK, and TPCK scales, items were all based on the instrument developed by Schmidt et al (2009), parallel survey instrument designed by Archambault & Crippen (2009), Rifion's Self Perception of Attitude towards New Literacy (2007) and the IRA Standards for Reading Professionals (2010).

For the purpose of describing the levels of knowledge of the pre-service teachers on TPCK scales, Instrument 2 did not use the 4-point scale (Strongly Agree to Strongly Disagree); instead, 5-point category (Excellent to Poor) scale based on the parallel survey instrument designed by Archambault & Crippen (2009) was used, thus increasing also its validity.

In interpreting the results of preservice elementary teachers' self assessment scores of their TPCK (its domain and combination of domains),

the scale that was used was:

4.20 to 5.00 - excellent

3.40 to 4.19 - very good

2.60 to 3.39 - good

1.80 to 2.59 - fair

1.00 to 1.79 - poor

Instrument 3- Preservice Teachers' Self Perception of their Teacher Educators' TPCK Modeling

In order to assess the perception of pre-service elementary teachers in their teacher educators' TPCK demonstration in the teacher preparation courses including their cooperating teachers' modeling in the practice teaching in relation with the pre-service teachers' development of TPCK, instrument 3 (Appendix C) was constructed.

Based on the related literature and expert validation, items 1 to 3 dealt with the TPCK modeling of literacy education professors, 4 to 6 with the instructional technology professors, 7 to 9 with the education foundation professors, 10 to 12 with professors outside literacy education, and items 13 to 15 covered grade 1 to 6 cooperating teachers' TPCK modeling inside the classroom.

The 15 items in Instrument 3 were actually part of the items developed under the TPCK scale of Instrument 2 and review of related literature. Three items about TPCK modeling for teacher educators were used under these categories: literacy education professors, instructional technology professors, education foundation professors, professors outside literacy education, and grade 1 to 6 cooperating teachers.

The pre-service teachers' assessment of their teacher educators' TPCK modeling or application was based on the measures or scales used in Self Perception of Attitude

towards New Literacy by Riñon (2007). For each construct or subscale, the respondents had to report their response on the survey following the 5-point Likert scale choosing from very high competence and always model TPCK (5) to anxious and lack competence and never model TPCK (1).

In interpreting the result of pre-service teachers' assessment of their teacher educators' TPCK modeling or application, the scale that was used was:

4.20 to 5.00 - very high competence and always model TPCK

3.40 to 4.19 - high competence and oftentimes model TPCK

2.60 to 3.39 - some competence and sometimes model TPCK

1.80 to 2.59 - little competence and seldom model TPCK

1.00 to 1.79 - anxious and lack competence and never model TPCK

EXPERT PANEL REVIEW

Since the survey instruments used in this study were not first created by the researcher, there is a need to further validate the content. Schutt (2006) recommends the use of a panel of experts to take full advantage of the likelihood of content validity and appropriate data collection instruments. Following the flow of methodology in figure 3, items were generated, adapted, and modified from parallel instruments and related literature and then reviewed by two (2) knowledgeable literacy experts and one (1) research professor.

The instruments' items were reviewed according to their suitability and completeness. Based on feedback from the experts, several changes were made to the instruments. In particular, more positive sentences were stated in the questionnaire instead of the negative ones. Thus, the researcher rephrased eight statements into positive against seven negatively set statements for the Personal Efficacy Belief Scale

for Teaching Reading (Instrument 1).

For Instrument 2, the items format was revised. Since knowledge was assessed, one of the experts recommended that instead of the item being stated in a declarative statement, it should just be formatted in certain way that it would measure what it intended to measure. For instance under TK scale, the statement "I know how to solve my own technical problems." was revised to "My knowledge in solving my own technical problems." Hence, respondents were requested to answer with a rating of excellent (5) down to poor (1). In addition, synthesizing the comments of the experts led to deleting one item from the original 6-item TK Scale, adding one item from the 6-item CK scale, and deleting one item each from both PCK and TPK scales.

Over all, there remained 36 items for the TPCK level Instrument 2. Nothing much had been changed for the 15-item Instrument 3, except for removing the ellipsis mark on each. Furthermore, instructions and items in the instruments were also refined and wordings were revised based on experts' remarks.

After considering the comments of the panel of experts, the 38-item Instrument 2 was reduced to 36 items. Instrument 1 and 3 remained the same in number but were polished for easy understanding of the respondents. All the draft instruments were emailed beforehand to 2 literacy experts and hard copy was personally given to a research professor; all the substantial experts' inputs were retrieved accordingly.

PILOT TESTING

The instruments were pilot tested on 10 pre-service teachers whose names were drawn from the graduating pre-service teachers. The pre-service teachers here

were actually part of the population; therefore, they are parallel representatives of the target population.

The three (3) instruments were administered for pilot testing at the Philippine Normal University, Quezon Campus. The researcher personally distributed the instruments to the 10 lottery-selected pre-service teachers. He verbally clarified to them the objectives of the instruments and the study taking into consideration that the results would be treated with utmost confidentiality and that their honest and well-thought responses would not in any way affect their course grades. He also timed how long the respondents completed the survey questionnaires. Then, he gave clarificatory questions for items not clear enough to the respondents.

Four respondents were a little confused on item numbers 2 and 9 of Instrument 1. Based on this feedback, items were carefully revised; wording such as "I wonder..." was replaced with "I doubt..." and some wordings were modified to make the items void of words that could puzzle the respondents. .

For instruments 2 and 3, two of the respondents cited that it would be better if the numerical response scale and its interpretation or even abbreviation were placed on top of each page of the instruments. After going through the directions and items of the instruments, they all agreed that the instruments *per se* were ready for actual data gathering with the target respondents.

Nonetheless, three of them suggested that it would be convenient if the researcher would administer the instruments during an assembly called for such purpose. On the actual pilot testing, instruments were retrieved minutes after the respondents completed the materials. The ten respondents completed the instruments within 14 minutes on the average.

FIELD TESTING

The remaining members of the population composed of ninety-seven (97) respondents were selected to become participants in the field testing. Because of occurrences beyond the researcher's and invited respondents' control, only eighty-seven (87) out of 97 respondents participated in the field testing. This number, however, was more than enough to go through the quantitative tests of the results to determine the instruments' reliability.

The researcher personally distributed the survey questionnaires to the 87 respondents and the same instructions were explained as what had been done during the pilot testing. All the instruments were administered and, immediately, retrieved by the researcher. No instruments were allowed to be brought home for it would only take on the average some 14 minutes for an individual to respond to the instruments as observed in the pilot testing.

The data gathered in the field test were right away subjected to computer analysis using the Statistical Package for Social Sciences, more commonly known as SPSS. The measure which was used was Cronbach's Alpha, a common measure of internal consistency of a psychometric test score for a sample of examinees.

Initially, Instrument 1 was composed of fifteen (15) items. After running the test of reliability on this scale, it resulted to a 0.438 which is interpreted as unacceptable (www.cronbachsalpha.com). To increase the value of its alpha within the boundary of acceptability, certain items and their data were reviewed in the SPSS program. After thorough analysis, the instrument 1 was remediated by deleting items 1, 2, 8 and 9. As a result, Instrument 1 had 11 items on its scale where six are positively stated items and five negatively stated. It had a Cronbach's Alpha of 0.706 generally interpreted as acceptable. The remaining Instruments 2 and 3 obtained high Cronbach Alphas of 0.80

and up, indicating considerable internal reliability on their field testing results.

Below is the summary of the results of the computation of internal consistency indicating the instruments' reliability.

Table 1. Reliability of the Scale Scores

Scales/Domains	N of items	N of respondents	Internal Consistency (Cronbach's Alpha)
Efficacy Beliefs	11	87	.706
Total Number of Items	**11**		
TPCK Levels			
Technology Knowledge (TK)	5	87	.859
Content Knowledge (CK) – Literacy	7	87	.872
Pedagogical Knowledge (PK)	7	87	.869
Pedagogical Content Knowledge (PCK)	5	87	.846
Technological Content Knowledge (TCK)	4	87	.892
Technological Pedagogical Knowledge (TPK)	4	87	.881
Technological Pedagogical Content Knowledge (TPCK)	4	87	.897
Total Number of Items	**36**		
TPCK Modeling			
Literacy Education Professors	3	87	.770
Instructional Technology Professors	3	87	.859
Education Foundation Professors	3	87	.914
Professors Outside Literacy Education	3	87	.879
Grade 1 to 6 Cooperating Teachers	3	87	.900
Total Number of Items	**15**		
Whole Scale	**62**		**.955**

CONTENT VALIDITY AND RELIABILITY

Items in the instruments were based on the existing scales and related literature. Having experts review the instruments to make sure that items were complete, suitable, and arranged in an appropriate format was important to establish an adequate level of content validity. When items were improved as a result of expert reviews and research adviser's inputs, the revised instruments' content validity was enhanced.

Furthermore, pilot testing and revisions after revisions even increased the

instruments' face validity to clear some grey areas found in the directions, wordings, aspects of grammar, mechanics, etc. within the scales before they were field tested. Ultimately, the high overall Cronbach's Alpha of .955 (See also Table 1) for the whole scales or instruments in the field test greatly contributed in increasing the reliability of the instruments.

DATA GATHERING PROCEDURE

Finally, the instruments were administered to the respondents in PNU campus days after their graduation. A special assembly was convened for this purpose in coordination with the University Executive Director and the Campus Head of Planning, Research and Extension. To encourage full attendance of the 50 sampled respondents, special prizes were given to 10 lucky participants in a raffle draw. Forty-seven respondents came and completed the instruments. There were forty females and seven males who participated in the actual data gathering. Like the field testing, same instructions were given to the respondents before, during, and after the instruments' administration. The instruments were right away retrieved for data coding, computation, and analysis.

DATA ANALYSIS PROCEDURE

Data obtained were treated primarily using quantitative measures to prevent bias in gathering and presenting research data. Descriptive and inferential statistics were employed to analyze and to interpret the bulk of information using measures that are easily understood. The former allows the researcher to describe the information contained in scores with just few indices, while the latter enables him to make inferences about the population. The mean and standard deviation of the scores in each scale were used to synthesize the entire distribution. The information were coded and

subjected to computer analysis using SPSS. It was used to calculate the descriptive statistics including means, standard deviations, and correlations (Fraenkel & Wallen, 2007). Table 2 shows a summary of the statistical procedures used.

Table 2. Summary of the Statistical Procedures Used

Variables	Analytical Procedure
Pre-service Teachers	***Descriptive Statistics***
a. Teaching Reading Self-Efficacy Belief	Mean, Standard Deviation
Pre-service Teachers TPCK Levels	
a. Technological Knowledge	
b. Content Knowledge	
c. Pedagogical Knowledge	
d. Pedagogical Content Knowledge	
e. Technological Content Knowledge	
f. Technological Pedagogical Knowledge	
g. Technological Pedagogical Content Knowledge	
Pre-service Teachers' Perception of their Teacher Educators TPCK modeling	
a. Literacy Education Professors	
b. Instructional Technology Professors	
c. Education Foundation Professors	
d. Professors Outside Literacy Education	
e. Grade 1 to 6 Cooperating Teachers	
Correlations between variables	***Inferential Statistics***
a. Teaching Reading Self-Efficacy Beliefs and TPCK Levels	Pearson Product Moment Correlation
b. Pre-service Teachers Teaching Reading Self-Efficacy Beliefs and Teacher Educators' TPCK modeling	
c. TPCK Levels and Teacher Educators' TPCK modeling	

Quantitative Analysis

1. Teaching Reading Self-Efficacy Beliefs: Descriptive Statistics

Mean scores and standard deviations from the Personal Efficacy Belief Scale for Teaching Reading were calculated. Likert scale multiple item was scored with a value of 1 assigned to strongly disagree all the way to 4 for strongly agree. This was applicable to positive statements (items 2, 3, 4, 8, 10, 11). For negatively worded statements (items 1, 5, 6, 7, 9) the scoring was reversed so that strongly agree would be as 1, and so on, with the

strongly disagree' scored as 4. The overall mean was used in evaluating the perceived confidence in teaching reading according to the scale provided.

2. TPCK Levels: Descriptive Statistics

For the seven components (items 1 to 36) of TPCK, descriptive measures including mean and standard deviation were calculated to assess the knowledge level of pre-service teachers using TPCK framework. Every Likert scale multiple item was scored with a value of 1 assigned to poor all the way to 5 for excellent. For each construct or subscale the participant's responses based on the 5-point Likert scale are averaged. For example, the 5 items under TK were averaged to produce one or an overall TK Scale Score. These descriptive statistical measures were tabulated for each subscale or scales which include PK, CK, TK, TCK, TPK, PCK, and TPCK.

3. TPCK Modeling: Descriptive Statistics

The 5-point Likert type items of Instrument 3 consisting of the three (3) similar items per set had five (5) subscales categorized into literacy education professors, instructional technology professors, education foundation professors, professors outside literacy education, and grade 1 to 6 cooperating teachers.

For each construct or subscale the participant's responses based on the 5-point Likert scale are averaged. For example, the 3 items under literacy education professors' TPCK modeling were averaged to produce an overall literacy education professors' TPCK modeling score. The same procedure was done in the other groups of TPCK teacher educators' modeling. Each area and/or subscale were likewise measured using mean and standard deviation to evaluate the perceived degree of TPCK modeling of the teacher educators as assessed by the pre-service teachers.

4. Correlation between Variables: Inferential Statistics

The degree of relationship between pre-service teachers' teaching reading efficacy

beliefs, TPCK levels and pre-service teachers' perception of their teacher educators' TPCK modeling was determined by Pearson Product Moment Correlation, at 0.05 level of significance. All subscales or domain scores were correlated with the aforementioned variables and the results of the correlation were presented in matrices or tables and were analyzed.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

This chapter, presented according to the six research questions, reports the results of the data analysis, the research findings, and their interpretation.

Research Question No. 1

What are the teaching reading efficacy beliefs of pre-service teachers?

Forty-seven respondents responded to the surveys to generate the required data for the 1st research question. Table 3 presents the mean of the entire sample for the Personal Efficacy Belief Scale for Teaching Reading.

Table 3. Level of Perceived Teaching Reading Efficacy Beliefs of Pre-Service Teachers

Personal Reading Teaching Efficacy Beliefs	Mean (n=47)	Standard Deviation (n=47)
1. I am not effective in monitoring reading comprehension.	3.00	0.51
2. I know the steps necessary to teach reading concepts effectively.	3.02	0.54
3. I generally teach reading effectively.	2.96	0.36
4. I understand the nature of reading well enough to be effective in teaching reading.	3.15	0.47
5. I find it difficult to explain the meaning of a text to students.	3.00	0.75
6. Given a choice, I would not invite my professors or cooperating teachers to evaluate my reading teaching.	3.30	0.62
7. When my students encounter difficulty in understanding a text, I am usually at a loss as to how to help them.	2.96	0.81
8. When teaching reading, I usually welcome student questions.	3.47	0.65
9. I do not know what to do to get students to read or be interested in reading.	3.09	0.54
10. To check students' comprehension, I always ask them questions of varying level.	3.45	0.58
11. Given a chance, I would talk about reading problems and remedies with my professors or cooperating teachers.	3.40	0.58
Overall Personal Reading Teaching Efficacy Beliefs	***3.06***	***0.25***

The result shows that the pre-service teachers maintained a high sense of efficacy in teaching reading as indicated by a mean of 3.06, which is within the range of 2.50 to 3.24, interpreted as high confidence.

With this result it could be inferred that pre-service teachers have more positive beliefs than negative ones with regard to teaching reading in the classroom. This supports the claim of Bandura (1996) that efficacy beliefs result from mastery experiences with the respondents' exposure to various opportunities—pre-service teacher training programs and practice teaching in the field as would-be teachers in the future.

Pre-service teachers also reported high confidence in their ability to provide quality reading instruction to create opportunities for student achievement as indicated in their favorable responses, showing their ability to ask varying questions, to welcome students' queries, and to coordinate with their teacher educators with regard to literacy instruction concerns. This study further confirmed Baccus' (2004) assertion that assisting teachers to develop favorable disposition toward teaching reading could impact student learning and teachers' professional development.

High confidence level of response was obtained because the respondents have just completed the requirements of their baccalaureate degree in elementary education. The literacy and literacy-related courses of the academic requirements of their program, combined with their experience in practice teaching, have been favorable for them to develop strong confidence in their literacy classroom activities.

Research Question No. 2

What is the perceived knowledge level of pre-service teachers in the areas of technology, pedagogy, and content, including combinations of these TPCK domains?

This study investigated the perceived knowledge level the pre-service teachers have in the areas of technology, pedagogy, and content, including combinations of these TPCK domains. The results displayed on Table 4 answered the research question No. 2.

Table 4. Summary of Pre-Service Teachers' Perceived Level of Technological Pedagogical Content Knowledge (TPCK)

TPCK Domains/Scales	N	Number of Items	Mean	Standard Deviation
Overall Technology Knowledge	47	5	**3.62**	0.52
Overall Content Knowledge-Literacy	47	7	**3.78**	0.41
Overall Pedagogical Knowledge	47	7	**4.06**	0.42
Overall Pedagogical Content Knowledge	47	5	**3.83**	0.46
Overall Technological Content Knowledge	47	4	**3.73**	0.57
Overall Technological Pedagogical Knowledge	47	4	**3.86**	0.57
Overall Technological Pedagogical Content Knowledge	47	4	**3.80**	0.55

The pre-service teachers rated their knowledge at the highest level for the scales of Pedagogy (4.06), Technological Pedagogical (3.86), and Pedagogical Content (3.83). These average mean scores indicate that pre-service teachers believe that their knowledge is very good in connection with their ability to monitor student performance, to adjust teaching styles, to assess student learning, combined with their TPK and PCK which include but are not limited to their ability to use appropriate technologies that enhance teaching and learning process, to assist students in connecting concepts across the curriculum, to design integrated, balanced literacy lesson plans, and to select effective approaches to guide student thinking and learning for literacy content.

The data on the aforementioned scales reveal that these pre-service teachers can comfortably navigate with the rudiments, methods, strategies, and processes of literacy instruction enhanced by educational technologies that enable them to create endless opportunities for students to grasp specific concepts in literacy.

Lagging behind PK, TPK and PCK scales are the scales in Content-Literacy (3.78), Technological Content (3.73), and Technology Knowledge (3.62). These three average means are still interpreted at the boundary of 'very good' within the range of 3.40 to 4.19. This, however, suggests that pre-service teachers are more knowledgeable in pedagogy than their CK and TK combined because of the 0.26 and 0.44 mean differences respectively.

The participants similarly felt that their CK associated with understanding of literacy, reading and writing development, reading across elementary years, explaining literacy research and theory, using multiple sources of information, and

other literacy-related foundation knowledge was not as strong as their knowledge related to PK and TPK.

Obviously, the lowest individually scored item fell within the area of TK. It was particularly observed in the item rating 'about my knowledge in playing around with technology,' in particular, with the mean of 3.38 which is interpreted to a rating of *Good*. However, the rest of the items under technology were all classified as 'Very Good'. With this result, it could be inferred that pre-service teachers have enough know-how to solve their technical problems, to recognize, and to use a lot of different technologies.

When technology was combined with content and pedagogy, scores scaled to 3.73 and 3.86, respectively. These ratings are not as high as those associated with pedagogy and content combined, but not as low as the domain of technology *per se*. In examining all three domains together and the interplay existing within the domains or scales, pre-service teachers, as a whole, rated their skills at 3.80 along the TPCK framework, interpreted as 'Very Good'. Consequently, the assumption that the pre-service teachers show to a certain extent Technological Pedagogical Content Knowledge levels is likewise proven.

In exploring the perceived knowledge levels of pre-service teachers within the TPCK framework, it becomes apparent that these teachers felt competent about their abilities to perform more than just traditional teachers. They were much certain of themselves when it came to their skills associated with pedagogy combining it with technology to convey literacy content to students. If compared to the work of Archambault and Crippen (2009) who investigated the knowledge level of K-12 online teachers, this study confirms their findings that teachers' knowledge ratings are also

highest among the domains of pedagogy and content but not that high on technology. This suggests that the technology area remains to be a domain to seriously deal with not only for in-service teachers since it covers various technologies not only present in the mainstream but also the emerging ones.

The results do not, however, communicate that respondents' teacher education institution has failed to provide pre-service teachers with the knowledge, skills and disposition required to adopt and to utilize technology effectively as what Marino, Sameshina, & Beecher (2009) assert for many teacher preparation programs. Instead, the results provide important components of pre-service teachers' knowledge that are germane to the sound fusion of technology in education to enhance the teacher preparation programs.

According to Mims (2004) purposeful efforts should be made to encourage pre-service teachers to reflect on and evaluate their perceptions about technology integration. Training pre-service teachers in this study could no longer be a daunting task. With considerable levels of TPCK, the pre-service teachers in this study are not anymore the kind of pre-service teachers who have poor self-esteem about their ability to use technology in instruction. Thus, enhancement of the teacher preparation program or curricula where there is a balanced and comprehensive development of pre-service teachers' knowledge in pedagogy, content, and technology is now finding a niche in this 21st century teaching and learning world.

Research Question No. 3

What is the extent of the teacher educators' TPCK modeling as perceived by the pre-service teachers?

The data in Table 5 shows the extent to which the respondents perceived the TPCK modeling of their teacher educators.

Table 5. Summary of Pre-Service Teachers' Self-Perception of Their Teacher Educators' TPCK Modeling

Teacher Educators	N	Number of Items	Mean	Standard Deviation
Overall Self Perception on Literacy Education Professors' Modeling	47	3	**3.85**	0.60
Overall Self Perception on Instructional Technology Professors' Modeling	47	3	**3.99**	0.63
Overall Self Perception on Education Foundation Professors' Modeling	47	3	**3.86**	0.72
Overall Self Perception on Modeling of Professors Outside Literacy Education	47	3	**3.75**	0.65
Overall Self Perception on Modeling of Grade 1 to 6 Cooperating Teachers	47	3	**3.36**	0.74

The pre-service teachers perceived that their teacher educators have high competence and they oftentimes model TPCK in the classroom. Arranged from the highest ratings, teacher educators obtaining very favorable assessments within the rating range of 3.40 to 4.19 are the instructional technology professors (3.99), education foundation professors (3.86), literacy education professors (3.85), and professors outside literacy education (3.75). As expected and very much apparent, the instructional technology professors got the highest average mean.

The results also show that except for the Grade 1 to 6 cooperating teachers, all the rest of the teacher educators were rated by the pre-service teachers to possess

considerable skills to demonstrate frequently the tasks in using technologies in the classroom, in applying strategies that combine the domains and in providing leadership that helps their student-teachers coordinate the use of content, technologies and teaching approaches.

With the average mean of 3.36, the Grade 1 to 6 cooperating teachers were perceived by the pre-service teachers to have some competence and sometimes demonstrate TPCK in the classroom. Albion (1996) put forward that the most significant factor influencing student teachers' use of technologies is the cooperating teachers' use of technologies with children. The result contradicts this assumption because pre-service teachers rated their university professors higher in this area compared with their cooperating teachers. It seems that what the elementary cooperating teachers lack to provide in TPCK modeling in the classroom, the university-based teacher educators compensate for.

The pre-service teachers, through this assessment, were able to identify conflicting ideas and to develop deeper and more thoughtful insights on the teacher educators' TPCK modeling and practices concerning technology integration; hence, their [pre-service teachers] beliefs and future implementation of TPCK in the field are formed and/or changed through the combination of various experiences they have had with their teacher educators.

These results have provided baseline information on the way teacher educators perform their functions outside and inside the university. The lowest mean falling to the side of grade 1 to 6 cooperating teachers (3.36) could mean that there could already be a need to look into and to improve the practice teaching program of the university. Deeper investigation on the student teaching experience in the field remains to be a fertile ground for future studies.

Research Question No. 4

What is the relationship between pre-service teachers' teaching reading efficacy beliefs and their perceived TPCK levels?

To determine the relationship between the mean of the efficacy beliefs and the TPCK score levels, the researcher computed the Pearson Product Moment Correlations (r-values) using SPSS. In order to make a decision whether the relationship exists is significant, the correlation coefficient must be equal to or bigger than the critical r of +/- 0.288. Specific correlations are presented in Table 6.

Table 6. Summary of Correlations (Pre-service Teachers' Teaching Reading Efficacy Beliefs and Their Perceived TPCK Level Scales)

Variables	*R-value*	*Relationship*	*Decision*
Beliefs and Technology Knowledge (TK) Level	0.232	Weak positive	Accept H_0
2. Beliefs and Content Knowledge (CK) – Literacy Level	0.177	Weak positive	AcceptH_0
3. Beliefs and Pedagogical Knowledge (PK) Level	0.232	Weak positive	Accept H_0
4. Beliefs and Pedagogical Content Knowledge (PCK) Level	**0.314**	Moderate positive	Reject H_0
Beliefs and Technological Content Knowledge (TCK) Level	0.230	Weak positive	Accept H_0
Beliefs and Technological Pedagogical Knowledge (TPK) Level	**0.320**	Moderate positive	Reject H_0
Beliefs and Technological Pedagogical Content Knowledge (TPCK) Level	0.266	Weak positive	Accept H_0
Critical r at alpha 0.05 = +/- 0.288			

A moderate but statistically significant relationship existed between efficacy beliefs and TPK level indicating that both constructs are directly related (r = .320, $p <$ .05, $n = 47$). Pre-service teachers with high confidence toward teaching reading also tended to have very good Technological Pedagogical knowledge level.

The same moderate yet statistically significant relationship prevailed between efficacy beliefs and PCK ($r = .314, p < .05, n = 47$). Similarly, pre-service teachers with a high sense of efficacy about teaching reading are also inclined to have very good Pedagogical Content Knowledge.

With these results, it could be inferred that the efficacious pre-service reading teachers tended to be more knowledgeable about how various technologies can be used in teaching and how to combine teaching strategies with literacy content or representations in order to facilitate student learning.

On the other hand, Table 6 shows weak relationship between efficacy beliefs, TK, CK, PK, TCK, and TPCK. This called for the acceptance of the null hypotheses on these variables; thus, teaching reading efficacy beliefs of pre-service teachers are unrelated to each separate domain or scale with regard to their knowledge in or about technologies, content literacy subject itself, methods and processes of teaching, and representation of literacy content through various technologies.

Since very little research or no study has been conducted on the correlation of efficacy beliefs and TPCK levels, generalization may only be based on the current investigation. In this case, it is interesting to note, however, that direct relation of efficacy beliefs have been significant on the interplay of pedagogy with technology and pedagogy with content. This dual combination may shed light on the interaction of domains existing in the TPCK framework (Mishra & Koehler, 2008) when correlated with other distinct variables outside the framework.

One of the reasons that the researcher could draw upon why pedagogy seemed to be the center stage of correlation may likely be the fact that the sample respondents have the highest rating on their pedagogical domain (average mean – 4.06). With high confidence in the respondents' ability to provide quality reading instruction

comes the pre-service teachers' high competence to deliver literacy instruction with technology and strategies coming very handy having proven than TPK and PCK levels are directly influenced by the value of teaching reading self-efficacy beliefs.

Research Question No. 5

What is the relationship between pre-service teachers' teaching reading efficacy beliefs and the perceived teacher educators' TPCK modeling?

Table 7 shows weak connection existing between pre-service teachers' teaching reading efficacy beliefs and teacher educators' TPCK modeling.

Table 7. Summary of Correlations (Teaching Reading Efficacy Beliefs and the Perceived Teacher Educators' TPCK Modeling)

Variable	R-value	Relationship	Decision
1. Beliefs and Literacy Education Professor Modeling	0.194	Weak positive	Accept H_0
2. Beliefs and Instructional Technology Professors Modeling	0.148	Weak positive	Accept H_0
3. Beliefs and Education Foundation Professors Modeling	0.163	Weak positive	Accept H_0
4. Beliefs and Professors Outside Literacy Education Modeling	0.175	Weak positive	Accept H_0
5. Beliefs and Grade 1 to 6 Cooperating Modeling	-0.116	Weak Negative	Accept H_0
Critical r at alpha 0.05 = +/- 0.288			

It is very apparent that the data on Table 7 reveal a weak relationship between efficacy beliefs and teacher educators' TPCK modeling in all categories as perceived by the pre-service teachers. None of the overall ratings of the pre-service teachers on their teacher educators' TPCK modeling and their efficacy beliefs scaled to surpass or at least equal the set critical value for correlation. Therefore, all the null hypotheses for this research question are accepted.

This means that on the basis of TPCK demonstration of the instructional technology professors, education foundation professors, professors outside literacy education, grade 1 to 6 cooperating teachers and even the literacy education professors inside the classrooms, the pre-service teachers do not always assure that they [pre-service teachers] will manifest high sense of efficacy for reading instruction because assessing efficacy beliefs does not solely revolve on the experience provided by the teacher educators. Other factors such as school culture, student and teacher interactions, problems on resources and professional training considerably influence teachers' confidence in instruction (Geoghegan et al, 2004).

It is also interesting to point out that pre-service teachers' sense of efficacy is also influenced by their belief that practical learning occurs in the real field of the classroom and the teacher education programs for them are theory based learning (Graham & Thornley, 2000). Like what Viray (2008) recommends, it is equally important for the pre-service teachers to examine their beliefs and practices not only to base theirs on their teacher educators' TPCK modeling; they should try to experiment on their various styles and philosophies to figure out which works best particularly in reading instruction in their own classroom setting.

On one hand, several factors might have been contributory to the weak and insignificant relationship of the variables investigated. They were the sources of data and the instrument used as cited in the delimitation of this study. Pre-service teachers might have overrated or underrated their assessment with their teacher educators' TPCK modeling. The fact that this survey research consisted of self-report for pre-service teachers rather than the measurement of observable behavior for the teacher educators to assess by themselves and be correlated to the pre-service teachers' assessment could also be a probable reason.

Research Question No. 6

What is the relationship between the pre-service teachers' TPCK levels and the teacher educators' TPCK modeling?

For clear and straightforward presentation of the results of correlation between pre-service teachers' TPCK levels (domain and combination of its domain) and teacher educators' TPCK modeling, Table 8 is drawn.

Table 8. Summary of Correlations (Pre-Service Teachers' TPCK Levels and the Teacher Educators' TPCK Modeling)

Variable		R-value	Relationship	Decision
1. Technology Knowledge (TK) Level	Literacy Education Professors	**0.335**	Moderate positive	Reject H_0
	Instructional Technology Professors	**0.350**	Moderate positive	Reject H_0
	Education Foundation Professors	**0.407**	Moderate positive	Reject H_0
	Professors Outside Literacy Education	**0.493**	Moderate positive	Reject H_0
	Grade 1 to 6 Cooperating Teachers	0.232	Weak positive	Accept H_0
2. Content Knowledge (CK) – Literacy Level	Literacy Education Professors	**0.438**	Moderate positive	Reject H_0
	Instructional Technology Professors	**0.397**	Moderate positive	Reject H_0
	Education Foundation Professors	**0.461**	Moderate positive	Reject H_0
	Professors Outside Literacy Education	**0.465**	Moderate positive	Reject H_0
	Grade 1 to 6 Cooperating Teachers	**0.361**	Moderate positive	Reject H_0
3. Pedagogical Knowledge (PK) Level	Literacy Education Professors	**0.365**	Moderate positive	Reject H_0
	Instructional Technology Professors	**0.321**	Moderate positive	Reject H_0
	Education Foundation Professors	**0.311**	Moderate positive	Reject H_0
	Professors Outside Literacy Education	**0.354**	Moderate positive	Reject H_0
	Grade 1 to 6 Cooperating Teachers	0.136	Weak positive	Accept H_0
4. Pedagogical Content Knowledge (PCK) Level	Literacy Education Professors	**0.390**	Moderate positive	Reject H_0
	Instructional Technology Professors	**0.338**	Moderate positive	Reject H_0
	Education Foundation Professors	**0.407**	Moderate positive	Reject H_0
	Professors Outside Literacy Education	**0.446**	Moderate positive	Reject H_0
	Grade 1 to 6 Cooperating Teachers	0.031	Weak positive	Accept H_0
Critical r at alpha 0.05 = +/- 0.288		Continuation of Table 8 next page...		

Cont...Table 8

5. Technological Content Knowledge (TCK) Level	Literacy Education Professors	**0.326**	Moderate positive	Reject H_0
	Instructional Technology Professors	**0.365**	Moderate positive	Reject H_0
	Education Foundation Professors	**0.383**	Moderate positive	Reject H_0
	Professors Outside Literacy Education	**0.394**	Moderate positive	Reject H_0
	Grade 1 to 6 Cooperating Teachers	0.109	Weak positive	Accept H_0
6. Technological Pedagogical Knowledge (TPK) Level	Literacy Education Professors	**0.338**	Moderate positive	Reject H_0
	Instructional Technology Professors	**0.326**	Moderate positive	Reject H_0
	Education Foundation Professors	**0.561**	Strong positive	Reject H_0
	Professors Outside Literacy Education	**0.446**	Moderate positive	Reject H_0
	Grade 1 to 6 Cooperating Teachers	0.149	Weak positive	Accept H_0
7. Technological Pedagogical Content Knowledge (TPCK) Level	Literacy Education Professors	**0.548**	Strong positive	Reject H_0
	Instructional Technology Professors	**0.516**	Strong positive	Reject H_0
	Education Foundation Professors	**0.547**	Strong positive	Reject H_0
	Professors Outside Literacy Education	**0.501**	Strong positive	Reject H_0
	Grade 1 to 6 Cooperating Teachers	0.152	Weak positive	Accept H_0
Critical r at alpha 0.05 = +/- 0.288				

Direct moderate correlations were found between TK and Professors outside Literacy Education ($r = .493$, $p < .05$, $n = 47$), Education Foundation Professors ($r = .407$), Instructional Technology Professors ($r = .350$), and Literacy Education Professors' ($r = .335$) TPCK modeling. Thus, the null hypotheses on these variables are rejected but the null hypothesis is accepted on the weak correlation between Technology Knowledge and Grade 1 to 6 Cooperating Teachers ($r=.232$).

The r-values reflect that, except for the cooperating teachers, all the rest of the university-based teacher educators' TPCK modeling seem to have strongly influenced the development of the pre-service teachers' knowledge about various technologies, ranging from low-technologies to digital technologies. Thus, it can be said that the pre-service teachers having very good TK level tended to have been influenced by very skilled university-based teacher educators or professors who oftentimes model appropriate TPCK in the classroom. In other words, the very competent and efficient professors and/or instructors they [pre-service teachers] have in integrating content, pedagogy and technology in their classroom; the more likely they will become very knowledgeable pre-service teachers.

Moderate direct correlations have also been found between CK level and all the teacher educators' modeling with respective r-values as follows: Professors outside Literacy Education ($r = .465$, $p < .05$, $n = 47$); Education Foundation Professors ($r = .461$); Literacy Education Professors ($r = .438$); Instructional Technology Professors ($r = .397$); and Grade 1 to 6 Cooperating Teachers ($r = .361$). Thus, the null hypotheses in all these variables are rejected. It is also noteworthy to delineate that it is only in this scale that all the teacher educators' TPCK modeling are significantly related to a distinct Content Knowledge level of pre-service teachers along the framework.

The SPSS generated correlation values reveal that pre-service teachers who have considerable level of literacy content knowledge may likely have very competent teacher educators in all levels or areas including cooperating or supervising teachers. In other words, the frequent TPCK modeling of these very knowledgeable professors /instructors /cooperative teachers may be tantamount to producing pre-service teachers whose ability in understanding literacy, in recognizing theories of

reading and writing development, understanding reading development across the elementary years, to name a few, are all in very positive territory.

On the 3rd scale of TPCK level, there exist moderate but significant relationships between PK and great majority of the teacher educators' modeling falling under the Literacy Education Professors ($r = .365, p < .05, n = 47$), Professors Outside Literacy Education ($r = .354$) and Instructional Technology Professors ($r = .321$) and Education Foundation Professors' TPCK modeling ($r = .311$). Therefore, the null hypotheses on all these categories of teacher educators are rejected. On one hand, Grade 1 to 6 Cooperating Teachers' ($r = .136$) resulted to weak relationship with pedagogical knowledge; thus accepting the null hypothesis in these variables.

It could be inferred, that notwithstanding the cooperating teachers, all the competent university-based teacher educators who oftentimes model TPCK in the classroom must have been strong value indicator on the development of pre-service teachers' Pedagogical Knowledge. Pre-service teachers who have very good knowledge level about the methods of teaching, classroom management, assessment, lesson plan development, and student learning, rooted from the fact they were trained by the aforementioned teacher educators.

Moderate yet significant correlations also have been established between PCK and Professors outside Literacy Education TPCK modeling ($r = .446, p < .05, n = 47$), Education Foundation Professors ($r = .407$), Literacy Education Professors ($r = .390$), and Instructional Technology Professors ($r = .338$). Accordingly, the null hypotheses on these variables are rejected but the null hypothesis is accepted on the weak correlation between the PCK and Grade 1 to 6 Cooperating Teachers ($r = .232$).

The results suggest that except for the Grade 1 to 6 Cooperating Teachers all the rest of the teacher educators' appropriate and frequent TPCK modeling are significant

contributors of pre-service teachers' advancement of PCK. Similarly, pre-service teachers who felt strong about their abilities to design complete literacy lesson plans, to apply effective teaching approaches to guide students' learning of literacy content among others have been under the tutelage or supervision of highly competent teacher educators who oftentimes model TPCK in the classroom.

On the 4th scale of TPCK level, there exist moderate yet significant associations between TCK level and almost all of the teacher educators' TPCK modeling whose r-values are as follow: Professors Outside Literacy Education ($r = .394, p < .05, n = 47$), Education Foundation Professors ($r = .383$), Instructional Technology Professors ($r = .365$), and Literacy Education Professors ($r = .326$). As usual, the null hypotheses on these variables are rejected but the null hypothesis is accepted on the weak correlation between the TCK level and Grade 1 to 6 Cooperating Teachers ($r = .109$).

With these r-values, it could be reasoned out that excluding the Grade 1 to 6 Cooperating Teachers' TPCK modeling, the rest of the highly proficient university-based teacher educators who oftentimes model TPCK in the classroom may have influenced the development of pre-service teachers' TCK. Hence, it is no wonder why the pre-service teachers rated 'very good' their TCK which includes but is not limited to the know-how in identifying technologies to teach literacy and in using various technologies that enhance learning concepts.

At this point, significantly strong association surfaced between pre-service teachers' TPK level and Education Foundation instructors' TPCK modeling ($r = .561, p < .05, n = 47$). On the other hand, the frequent moderate yet statistically significant relationship existed alongside the Professors outside Literacy Education ($r = .446$), Literacy Education Professors ($r = .338$) and Instructional Technology Professors'

modeling (r = .326). As a result, the null hypotheses on these variables are rejected but the null hypothesis is accepted on the weak correlation between the TPK level and Grade 1 to 6 Cooperating Teachers (r =.149).

It could also be inferred that highly adept university-based teacher educators' TPCK modeling may be considered as a very strong factor in the formation of pre-service teachers' TPK level. In other words, the greater the competence and the more frequent teacher educators appropriately model TPCK in the classroom, the more competent pre-service teachers would become in using technologies that enhance teaching and learning process and in thinking critically about the use of appropriate technology in the classroom among others.

Overall, significantly high positive correlation prevailed between the pre-service teachers' TPCK level and university instructors or professors' TPCK modeling categorized under Education Foundation Professors ($r = .547, p < .05, n = 47$), Literacy Education Professors (r = .548), Instructional Technology Professors (r = .516), and Professors Outside Literacy Education (r = .501). Thus, the null hypotheses on these variables are rejected but the null hypothesis is accepted on the weak correlation between the TPCK level and Grade 1 to 6 Cooperating Teachers' TPCK modeling (r =.152).

All the data in the Table 8 boiled down to the correlation values existing between pre-service teachers' TPCK level (combination of all the domains) and their perceived TPCK modeling of their teacher educators. The value on this scale confirmed the findings of all the scales in the framework. Hence, it is safe to deduce that all the teacher education institution professors or instructors, except for the Grade 1 to 6 Cooperating Teachers, may have exerted significantly strong influence on the

development of pre-service teachers' TPCK level or the knowledge required by teachers for integrating technology into their teaching of literacy content.

The assumption that the pre-service teachers show some extent of TPCK in relation to their perceived favorable teacher educators' TPCK modeling is held true as results revealed. In a related study Jong (2010) validated how supervising teachers could become effective model for technology integration considering the TPCK development of pre-service teachers. Data found in this study, however, shows that Grade 1 to 6 Cooperating or Supervising Teachers' TPCK modeling is found to have weak or non-existence of relationship at all between pre-service teachers TPCK knowledge levels.

The fact is that pre-service teachers' not so very good assessment (low mean = 3.36) could have been a valid reason for unrelatedness of the variables. Pre-service teachers' rating of their cooperating teachers which is interpreted as having some competence and sometimes modeling of TPCK is an indication that their cooperating teachers do not regularly show what are expected of them as models. It could be inferred that pre-service teachers' experiences with their cooperating teachers in the field were not so very favorable for the development of their [pre-service teachers] TPCK compared to their university-based teacher educators' modeling.

CHAPTER V

SUMMARY AND CONCLUSIONS

SUMMARY

This chapter presents the summary, conclusions, and implications for strengthening the teaching reading efficacy beliefs of pre-service teachers and aspects of the teacher preparation programs through consideration of the TPCK framework in a technology enhanced-instruction.

The study aimed to examine the preservice teachers' reading efficacy beliefs, TPCK knowledge levels and their perceived teacher educators' TPCK modeling. The assumption that the pre-service teachers show to a certain extent teaching reading confidence and TPCK levels is held true. Their self-rating scores indicate high sense of efficacy in teaching reading and very good TPCK levels. On separate domains, their TK and CK mean scores are lesser compared to PK. And, the TK level received the lowest mean. The pre-service teachers, on the other hand, report that their university-based teacher educators have high competence and oftentimes model TPCK in the classroom while their cooperating teachers have some competence and sometimes demonstrate TPCK in their student teaching program.

Moderate but statistically significant relationship existed between teaching reading efficacy beliefs and TPK and PCK. There is a weak and/or no relationship surfacing between the efficacy beliefs and TK, CK, PK, TCK and TPCK levels. Furthermore, there is no significant relationship between efficacy beliefs and teacher educators' TPCK modeling.

Moderate positive correlations have been found between Literacy Education Professors, Instructional Technology Professors, Education Foundation Professors, and

outside Literacy Education Professors' TPCK modeling and the pre-service teachers' TPCK scales of TK, PK, PCK, TCK and TPK. Only between the separate TPCK domain of CK and all the categories of teacher educators existed moderate direct significant relationship and, in the rest of TPCK levels or scales, no significant relation with the Grade 1 to 6 cooperating teachers has been found.

Although there is no significant relationship existing between the combination of all the domains – TPCK and the Grade 1 to 6 cooperating teachers' TPCK Modeling, significantly strong positive relationship, as a whole, has been established between pre-service teachers TPCK levels and the Literacy Education Professors, Instructional Technology Professors, Education Foundation Professors, and outside Literacy Education Professors' TPCK modeling. Thus, the assumption that the pre-service teachers show some extent of TPCK in relation to their perceived teacher educators' TPCK modeling is justified in this study.

CONCLUSIONS

The graduating pre-service teachers' high confidence level suggests that favorable teacher preparation program for teaching reading has been provided. With the sufficient pre-service education implemented by the university-based professors or instructors including the favorable practice teaching experience under their respective supervising or cooperative teachers, it is safe to conclude that the pre-service teachers have high sense of efficacy in reading instruction and they have felt strongly about their knowledge to teach lessons that appropriately combine literacy content, and mainstream and emerging technologies with sound pedagogical approaches and/or strategies; nonetheless, translating the beliefs into the right attitude and concrete

actions to help learners become functional reader remains to be seen in their professional career in the real classroom setting.

Although the TPCK levels of the pre-service teachers are in the positive territory, balance of TPCK development has yet to be attained by pre-service teachers, particularly on enhancing their TK along the level PK and CK. A balanced TPCK development could mean stability of teachers to navigate the affordances and constraints in infusing emerging technologies with literacy content and pedagogy.

The kind and the extent to which teacher educators model TPCK in the classroom do not guarantee that pre-service teachers, in return, will have high sense of efficacy with regard to teaching reading. Pre-service teachers' sense of confidence is influenced heavily by so many internal and external factors. And, since strong or moderate connection between teaching reading efficacy beliefs and the perceived teacher educators TPCK modeling was not found and only significant relationship existed between teaching reading efficacy beliefs and TPK and PCK, a restructure of the proposed conceptual framework is presented in Figure 3 in the context of teacher preparation program.

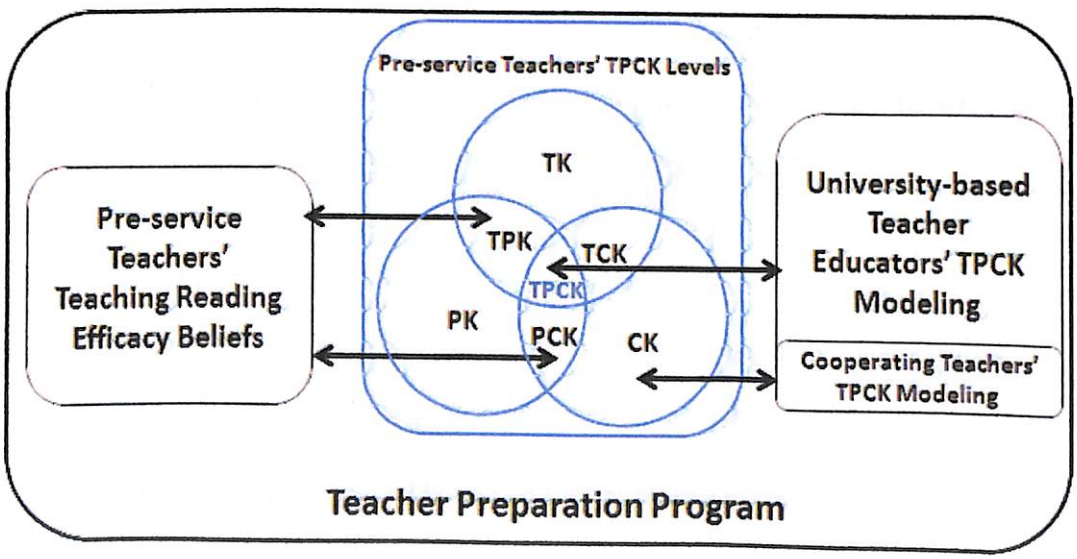

Figure 3. Restructured Conceptual Framework

Grade 1 to 6 cooperating teachers are also the models of pre-service teachers in the real classroom setting. They [cooperating teachers] should, often if not always, demonstrate appropriate TPCK modeling experience. Inability to provide such experience may be drawn from their lack of training and technologies to use in the classroom. It may have been the same case for some professors or instructors.

University-based teacher educators remain to be formidable models of TPCK application in the classroom. Hence, the nature and curricula of teacher preparation and programs being implemented by the Literacy Education Professors, Instructional Technology Professors, Education Foundation Professors, and outside Literacy Education Professors influence the pre-service teachers' development of TPCK. Indeed, pre-service teachers' very favorable assessment of the teacher educators' application of TPCK is equated on their self-assessments of their levels of TPCK.

Within the revised conceptual framework it is still sensible to construe that teacher educators play the pivotal role on the formation of pre-service teachers' TPCK. They [highly skilled teacher educators] are given the power to create opportunities not only to develop but also to make sure that stability or equal leveled growth of knowledge in technology, pedagogy, and content is achieved. Having less of or insufficient knowledge level of one of the domains could cripple the affordances and benefits each of the domains and their interplay have to offer.

IMPLICATIONS

In light of the findings and conclusions presented, implications are proposed parallel to the significance of the study:

School Administrators. Having control over administrative matters, school or teacher education institution heads should take a transformative leadership role in adapting 21st century educational paradigm that works under the TPCK framework.

Specifically, they may initiate activities like literacy clubbing, teaching reading seminar-workshops, conferences, mentoring program and other instructional support that will further boost pre-service teacher's confidence and attitude toward reading as an art and craft. They could also support literacy and literacy related programs or activities of teacher educators and/or student teachers by providing the technological facility requirements, human resource, time, etc. and by investing on acquiring essential technological devices or facility that could improve the literacy training and teacher preparation program of the university. Similarly, they could show leadership in designing instructional materials, evaluation instruments, microteaching activities, and practice teaching program that will both require pre-service teacher and teacher educators, particularly, cooperating or supervising teachers to observe, to apply and to assess in a regular basis each other TPCK modeling across the curriculum grades and content areas. To sustain such efforts and to showcase best practices, teacher educators who exceptionally and consistently model TPCK in the classroom should be given recognition in any form like career promotion, addition monetary incentives, grant, and other reward and award systems.

Teacher practitioners and/or educators. As a matter of professional development to improve teaching-learning strategies and student performance, teacher practitioners and/or teacher educators should regularly self-examine their TPCK levels and modeling as basis for need assessment. They could focus in enhancing the areas of content and technology knowledge and/or the specific domain or scales which they reported low or insufficient of, thus they could determine the nature and scope of capability building activities which they could participate in. Teacher educators should not only attain a very good level of TPCK but also implement with great consistency TPCK modeling inside and outside the classroom. Implementing an

effective and efficient TPCK modeling requires planning, adapting and/or developing instructional materials that incorporate concepts to be learnt, using mainstream and emerging tools combined with the appropriate teaching-learning strategies.

Students. Pre-service teachers or teacher candidates alike should regularly monitor their teaching reading self-efficacy beliefs and TPCK levels. They should not be afraid to play with online and offline educational technologies that offer infinite possibilities in advancing the teaching-learning process. Seeking support or becoming a mentee should become a matter of students' initiative. They should also remain cognizant of emulating the best practices of their teacher educators' TPCK modeling by adapting such practices and by incorporating their own beliefs, philosophies, and strategies coupled with the right teaching attitude from beginning of their of program to their practice teaching and actual teaching work in the future.

Research Concerns. The findings have significant implications, particularly in the field of teacher preparation research and development. Researchers who have interest in the affordances and constraints of literacy program and technology-enhanced instruction under the roof of TPCK should be more involved in conducting a follow up investigation with emphasis in the validation of instruments and models used in this study and in widening the coverage that includes different phases of pre-service teachers (beginning pre-service teachers and graduating pre-service teachers) and in-service teachers (beginning teachers and master teachers). In addition, the impact of teacher educators especially cooperating teachers' TPCK modeling in the pre-service teachers' beliefs and knowledge in other content areas using varied research designs and methods of data collection is still a fertile ground for future inquiries. Research collaboration with other teacher education institution is advised for partnership in promoting the transformational 21st century educational paradigm.

BIBLIOGRAPHY

Albion, P. R. (1996). Student teachers` use of computers during teaching practice in primary classrooms. *Asia-Pacific Journal of Teacher Education, 24*(1), 63-73.

Albion, P. R. (2003). None. *Graduating Teachers' Dispositions for Integrating Information and.* Retrieved November 20, 2011, from http://www.usq.edu.au/users/albion/papers/site03/3756.pdf

Al-Hazza, T.C, Fleener, C. & Hager, J. (2008). Primary teachers' knowledge and knowledge calibration of Early literacy practices. Primary teachers' knowledge and knowledge calibration of Early literacy practices. . *The Reading Matrix*, 8(1), 1-11. Retrieved January 5, 2012 from http://www.readingmatrix.com/articles/al-hazza_fleener_hager/article.pdf

Angeli, C. &Valanides, N. (2008). TPCK in pre-service teacher education: Preparing primary education students to teach with technology. Paper presented at the annual meeting of the American Educational Research Association, New York City, NY. http://punya.educ.msu.edu/presentations/AERA2008/AngeliValanides_AERA2008.pdf

Archambault, L. & Crippen, K. (2009). Examining TPACK among K-12 online distance educators in the United States Contemporary Issues in Technology and Teacher Education, 9(1). Retrieved from http://www.citejournal.org/vol9/iss1/general/article2.cfm

Baccus, A.A. (2004). Urban fourth and fifth grade teachers' reading attitudes and efficacy beliefs: relationships to reading instruction and to students' reading attitudes and efficacy beliefs. University of Maryland. Dissertation. College Park, USA. Retrieved February 2, 2012 from http://drum.lib.umd.edu/bitstream/1903/1420/1/umi-umd-1435.pdf

Bandura, A. (1996). *Self-efficacy in changing societies.* New York: Cambridge University Press.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: Freeman.

Becker, H. J. (2000). *Findings from the teaching, learning, and computing survey: Is Larry Cuban right?* Retrieved October 2, 2011, from http://www.crito.uci.edu/tlc

Cabaroglu, N., &Yurdaisik, A. (2008). University instructors' view about and approaches to reading instruction and strategies. *The Reading Matrix, 8*(2), 133-147. Retrieved January 5, 2012, from http://www.readingmatrix.com/articles/cabaroglu-yurdaisik/article.pdf

Chai, C. S., Koh, J. H. L., & Tsai, C.-C. (2010). Facilitating Preservice Teachers' Development of Technological, Pedagogical, and Content Knowledge (TPACK). *Educational Technology & Society, 13* (4), 63-73. http://www.ifets.info/journals/13_4/7.pdf

Couros, A. (2002) The ITEACHERED PROJECT: developing an instructional technology integration model for teacher education programs to enhance classroom teaching and learning. Retrieved November 2, 2011, from http://education.uregina.ca/iteachered/downloads/Couros-iTeacherProject-Samos.pdf

Cox S. & Graham C.R. (2009). Diagramming TPACK in practice: Using an elaborated model of the TPACK framework to analyze and depict teacher knowledge. TechTrends. 53, 5, pp. 60-69.

Cronbach's alpha. (n.d.). *Cronbach's alpha*. Retrieved March 30, 2012, from http://www.cronbachsalpha.com/

Cyrus, J.D. (2006). Pre-service teacher's perceptions of student-centered approach to integrating technology in content areas. Texas Tech University. Dissertation. Retrieved November 15, 2011, from http://dspace.lib.ttu.edu/bitstream/handle/2346/1274/Cyrus_Jacquelyn_Diss.pdf;jsessi onid=7078C4EAE1FD4DAE68FDB558D1E1D1B6?sequence=1

Dell, D. (n.d.). Reading and Technology: Make the Connection. *Teaching and Learning with Technology: Diana Dell, Ed.S. - InstructionalTechnology Specialist for the Valley Park School District*. Retrieved February 15, 2012, from http://mrsdell.org/reading/

Edora, J.G. (2010). Teaching beliefs and teaching styles. University of the Philippines. Thesis. Diliman, Quezon City.

Fraenkel, J. R., &Wallen, N. E. (2007). *How to design and evaluate research in education* (6 ed.). Asia International Edition: McGraw-Hill Education.

Geoghegan, N., Geoghegan, D., O'Neill, S., & White R. (2004) Preservice early childhood teachers' self efficacy, teacher, preparedness and facilitating children's learning of concepts in multiple contexts. Retrieved January 5, 2012 from http://www.aare.edu.au/04pap/geo041041.pdf

Gill, L. &Dalgarno, B. (2008). Influences on pre-service teachers' preparedness to use ICTs in the classroom. *In Hello! Where are you in the landscape of educational technology?Proceedingsascilite Melbourne 2008*. http://www.ascilite.org.au/conferences/melbourne08/procs/gill.pdf

Glifonea, D. &Mayani, J. (2010). Teachers' perspectives on the use of technology in teaching professional education courses to preservice teachers. *MSEUF Research Studies , 12* (February 2010), __ to __.

Gordon, L. M. (2001). High teacher efficacy as a marker of teacher effectiveness in the domain of classroom management. San Diego, CA.

Gowie, Cheryl J. (2010). "Developing Efficacy Beliefs in Preservice Teachers" *NERA Conference Proceedings 2010.* Paper 11. http://digitalcommons.uconn.edu/nera_2010/11

Graham, S. &Thornley, C. (2000). Connecting classrooms in preservice education: conversations for learning. *Asia-Pacific Journal of Teacher Education, 28*(3).

Grossman, P. L., &Richert, A. E. (1988). Unacknowledged Knowledge Growth: A Re-Examination of the Effects of Teacher Education. *Teaching and Teacher Education, Vol. 4, Issue 1, pp. 53-62.*

Henson, R. (2001, January 26). Teacher self-Efficacy: substantive implications and measurement dilemmas. *Educational Research Exchange.* Lecture conducted in University of North Texas , Texas. http://des.emory.edu/mfp/EREkeynote.PDF

Hermosa, N. N. (2010, November 3-7). The New Technologies and The Reading Teacher. *2010 Asian Literacy Conference.* Lecture conducted in the Reading Association of the Philippines, Manila. Retrieved November 3, 2011, from http://rap.org.ph/2010/wordpress/wpcontent/uploads/2011/04/2010ALC_NNHermosa 1.pdf

Holmes, A. (2003). *Smart things to know about technology management.* Oxford, United Kingdom : Capstone Publishing Ltd.

Intel World Ahead Program Education (2009). Positive Impact of eLearning.:*Laptop, Desktop, Server and Embedded Processor Technology - Intel.* Retrieved November 15, 2011, from http://www.intel.com/content/www/us/en/world-ahead/world-ahead-positive-impact- of-elearning-paper.html

International Reading Association's Standards for Reading Professionals (2010).What reading educators need to know. *International Reading Association home page.* Retrieved March 17 , 2012, from http://www.reading.org/General/Publications/ReadingToday/RTy_AugustSept_2010/RTY_10AugSept_Standards_Reading.aspx

Jong, J. S. (2010). Using a transformative model of integrating technology and peer coaching to develop TPCK of pre-service science teachers . *FacilitatingEffective Student Learning,* 121-150. Retrieved November 3, 2011, from http://ceps.pef.uni-lj.si/knjiznica/doc/zuljan-vogrinc.pdf

Koç, M. (2005). Implications of learning theories for effective technology. *Journal of Turkish Science Education, 2*(May 2005). Retrieved November 15, 2011, from http://www.tused.org/internet/tused/archive/v2/i1/fulltext/tusedv2i1s1.pdf

Lontoc, G.M. (2007). How teaching reading practices address the reading comprehension needs of selected first year high school students of Batangas National High School. Thesis. Ateneo de Manila University, Manila

Lock, J. & Redmond, P. (2010). Transforming pre-service teacher curriculum: observation through a tpack lens. In C.H. Steel, M.J. Keppell, P. Gerbic& S.

Housego (Eds.), *Curriculum, technology & transformation for an unknown future. Proceedings ascilite Sydney 2010* (pp.559-564). http://ascilite.org.au/conferences/sydney10/procs/Lock-concise.pdf

Loveless, T. (1996). Why aren't computers used more in schools? *Educational Policy, 10*(4), 448-467.

Marino, M. T., Sameshima, P., & Beecher, C. C. (2009). Enhancing TPACK with assistive technology: Promoting inclusive practices in preservice teacher education. *Contemporary Issues in Technology and Teacher Education, 9*(2). Retrieved from http://www.citejournal.org/vol9/iss2/general/article1.cfm

Mayani, J.S. (2009). Effectiveness and efficacy of information and communication technology (ICT) in the pre-service training of liberal arts, commerce and education students of Manuel S. Enverga University Foundation. Thesis. Manuel S. EnvergaUniversity Foundation. Lucena City.

Meskill C. (2002). *Teaching and learning in real time: media, technologies and language acquisition.* Houston. TX: Athelstan.

Mims, C. (2004). Beginning preservice teachers' perceptions of computer integration. University of Georgia. Dissertation. Retrieved November 15, 2011, from http://clifmims.com/site/documents/Dissertation-ClifMims.pdf

Mishra, P. & Koehler, M. J. (2008). Introducing technological pedagogical content knowledge. Paper presented at the Annual meeting of the American Educational Research Association, New York City, NY. http://punya.educ.msu.edu/presentations/AERA2008/MishraKoehler_AERA2008.pdf

Mishra, P. & Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A framework for teacher knowledge. *Teachers College Record.* 108(6), 1017-1054.

Ponessa, J. (1996). Demand for technology-savy workers falling short of supply. *Education Week, 15*(40).

Riggs, I., & Enochs, L. (1990). Toward the development of an elementary teacher's science teaching efficacy belief instrument. *Science Education, 74,* 625-638.

Riñon , B.B. (2007). Teachers' readiness for and their attitude toward new literacy. Faculty of Education, University of the Philippines Open University. Thesis. Los Baños, Laguna.

Schmidt, D. A., Baran, E., Thompson, A. D., Mishra, P., Koehler, M. J., & Shin, T. S. (2009). Technological Pedagogical ContentKnowledge (TPCK): The development and validation of an assessment instrument for preservice teachers. *Journal of Research on Technology in Education, 42*(2), 27.

Schutt, R. K. (2006). *Investigating the social world* (5 ed.). California, USA: Pine Forge Press.

Shulman, L. (1986). Paradigms and research programs in the study of teaching: A contemporary perspective. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (3rd ed., pp. 3-36). New York: MacMillan

Shulman, L. (2008). The work of Dr. Lee Shulman. *Lee Shulman . net.* Retrieved October 10, 2011, from http://www.leeshulman.net/domains-pedagogical-content-knowledge.html

Shultz, E., Neyhart, K., &Reck, U.M. (1996). Uphill all the way: an investigation of attitudinal predispositions of preservice teachers towards diversity in urban classrooms. *Teacher Educator, 32*(1), 22-36.

Siniscalco, M. T., &Auriat, N. (2005). Module 8. *Quantitative research methods.* Retrieved January 15, 2012, from http://www.iiep.unesco.org/fileadmin/user_upload/Cap_Dev_Training/Training_ Mate rials/Quality/Qu_Mod8.pdf

Tolentino, C.V. (2001). The integration of educational technology in science of selected secondary private schools of Lucena City. Thesis. Manuel S. Enverga University Foundation. Lucena City.

Tschannen-Morgan, M. & Hoy A. W. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education, 17*, 783-805.

Viray E.T. (2008) Teachers' beliefs about reading and reading instruction and a redesigned developmental reading course. University of the Philippines. Dissertation. Diliman, Quezon City.

Wang, Y. M. (2002). From teacher-centeredness to student-centeredness: are preserviceteachers making the conceptual shift when teaching in information age classrooms? *Educational Media International, 39*(3/4), 257-265.

Whetstone, L. & Carr-Chellman, A. A. (2001). Preparing preservice teachers to use technology: Survey results.*TechTrends, 45*(4), 11-17.

Wiersma, W. (1995). *Research methods in education: an introduction* (6 ed.). Massachusetts, USA: Allyn and Bacon.;

APPENDICES

APPENDIX A

INSTRUMENT 1

Control /Identification Number: _____

A. PERSONAL EFFICACY BELIEF SCALE FOR TEACHING READING

For each of the question or statement, please ***encircle*** the number that you feel about teaching reading in the classroom. There is no right or wrong answer. Answer the questions in the order in which they appear on the paper.

Your individual name or identification number will not at any time be associated with your responses. Your responses will be kept completely ***confidential*** and will not influence your course grade. Thank you for your co-operation.

Follow this legend: 4 - Strongly Agree (SA), 3 - Agree (A), 2 - Disagree (D), and 1-Strongly Disagree (SD).

Beliefs	4 (SA)	3 (A)	2 (D)	1 (SD)
1. I am not effective in monitoring reading comprehension.	4	3	2	1
2. I know the steps necessary to teach reading concepts effectively.	4	3	2	1
3. I generally teach reading effectively.	4	3	2	1
4. I understand the nature of reading well enough to be effective in teaching reading.	4	3	2	1
5. I find it difficult to explain the meaning of a text to students.	4	3	2	1
6. Given a choice, I would not invite my professors or cooperating teachers to evaluate my reading teaching.	4	3	2	1
7. When my students encounter difficulty in understanding a text, I am usually at a loss as to how to help them.	4	3	2	1
8. When teaching reading, I usually welcome student questions.	4	3	2	1
9. I do not know what to do to get students to read or be interested in reading.	4	3	2	1
10. To check students' comprehension, I always ask them questions of varying level.	4	3	2	1
11. Given a chance, I would talk about reading problems and remedies with my professors or cooperating teachers.	4	3	2	1

APPENDIX B

INSTRUMENT 2

B. PRESERVICE TEACHERS' PERCEIVED TECHNOLOGICAL PEDAGOGICAL AND CONTENT KNOWLEDGE (TPCK) LEVELS

Technology is a broad concept that can mean different things. For this questionnaire, technology refers to digital technology/technologies or the digital tools we use such as computers, laptops, iPods, handhelds, interactive whiteboards, software programs, etc.

Please rate how you perceive your level of Technological Pedagogical Content Knowledge (TPCK) to integrate ICT in instruction by encircling the number opposite each statement.

Follow this legend: 5 -Excellent, 4 - Very Good, 3 - Good, 2 - Fair, and 1 - Poor

TECHNOLOGY KNOWLEDGE (TK) *My knowledge...*	**5 (E)**	**4 (VG)**	**3 (G)**	**2 (F)**	**1 (P)**
1. in solving my own technical problems	5	4	3	2	1
2. in using technology easily	5	4	3	2	1
3. in keeping up with new technologies	5	4	3	2	1
4. in playing around with the technology	5	4	3	2	1
5. in recognizing a lot of different technologies	5	4	3	2	1
CONTENT KNOWLEDGE (CK) – LITERACY *My knowledge...*					
6. in using different strategies to develop my understanding of literacy.	5	4	3	2	1
7. in recognizing theories of reading and writing development.	5	4	3	2	1
8. in understanding reading development across elementary years or the nature of emergent literacy.	5	4	3	2	1
9. in explaining research and theory about effective learning environments that support motivation to read and write.	5	4	3	2	1
10. in keeping or being updated with the milestones in teaching reading or reading studies	5	4	3	2	1
11. in showing fairness, empathy, and ethical behavior in literacy instruction	5	4	3	2	1
12. in using multiple sources of information to guide instructional planning to improve reading achievements of all students	5	4	3	2	1

PEDAGOGICAL KNOWLEDGE (PK) ***My knowledge...***	**5 (E)**	**4 (VG)**	**3 (G)**	**2 (F)**	**1 (P)**
13. in monitoring student performance in a classroom.	5	4	3	2	1
14. in adapting my teaching based upon what students currently understand or do not understand.	5	4	3	2	1
15. in adjusting my teaching style with different learners.	5	4	3	2	1
16. in assessing student learning in multiple ways.	5	4	3	2	1
17. in using different teaching approaches in the classroom.	5	4	3	2	1
18. in identifying the typical student difficulties	5	4	3	2	1
19. in managing my class	5	4	3	2	1
PEDAGOGICAL CONTENT KNOWLEDGE (PCK) ***My knowledge...***					
20. in anticipating student difficulties with a particular topic	5	4	3	2	1
21. in designing integrated, comprehensive, and balanced literacy lesson plans	5	4	3	2	1
22. in using different types of texts (e.g. narrative, expository, etc.) when teaching particular topic/s	5	4	3	2	1
23. in assisting students to connect concepts across the curriculum	5	4	3	2	1
24. in selecting effective teaching approaches to guide student thinking and learning for literacy content.	5	4	3	2	1
TECHNOLOGICAL CONTENT KNOWLEDGE (TCK) ***My knowledge...***					
25. in identifying technologies to teach literacy	5	4	3	2	1
26. in using technologies (e.g. multimedia, laptop etc.) to demonstrate concepts in reading and writing.	5	4	3	2	1
27. in utilizing offline and online tools or applications to deliver literacy instruction	5	4	3	2	1
28. in using technologies that enhance learning concepts	5	4	3	2	1
TECHNOLOGICAL PEDAGOGICAL KNOWLEDGE (TPK) ***My knowledge...***					
29. in using technologies that enhance teaching and learning process	5	4	3	2	1
30. in adapting the technologies that I am learning to different teaching activities	5	4	3	2	1
31. in creating technology-assisted environment which allow students to use technology and to build new knowledge and skills	5	4	3	2	1
32. in thinking critically about the use of appropriate technology in my classroom	5	4	3	2	1
TECHNOLOGICAL PEDAGOGICAL	**5**	**4**	**3**	**2**	**1**

CONTENT KNOWLEDGE (TPCK) ***My knowledge...***	**(E)**	**(VG)**	**(G)**	**(F)**	**(P)**
33. in teaching lessons that appropriately combine literacy, technologies, and teaching approaches	5	4	3	2	1
34. in using technologies in my classroom that enhance what I teach, how I teach, and what students learn	5	4	3	2	1
35. in applying strategies that combine content, technologies, and teaching approaches that I learned in my coursework in my classroom	5	4	3	2	1
36. in providing leadership in helping others to coordinate the use of content, technologies, and teaching approaches at my school	5	4	3	2	1

APPENDIX C

INSTRUMENT 3

C. PRE-SERVICE TEACHERS' SELF PERCEPTION OF THEIR TEACHER EDUCATORS' TPCK MODELING

Please indicate how you feel about the statement below in terms of the application of your teacher educators' Technological Pedagogical Content Knowledge (TPCK) in instruction by encircling the number opposite each statement..

The legend is as follows: **5 – *Agree and Always apply TPCK (AA)*, 4 – *Agree and Oftentimes apply TPCK (AO)*, *3 – Agree and Sometimes Apply TPCK (ASS)*, *2- Agree but Seldom apply TPCK (AS)*,** and ***1- Disagree and never apply TPCK (DN).***

TPCK Models					
My literacy education professors...	**5 (AA)**	**4 (AO)**	**3 (ASS)**	**2 (AS)**	**1 (DN)**
1. use technologies in the classroom that enhance what they teach, how they teach and what we [students] learn.	5	4	3	2	1
2. apply strategies that combine content, technologies, and teaching approaches in the classroom.	5	4	3	2	1
3. provide leadership in helping their students to coordinate the use of content, technologies and teaching approaches.	5	4	3	2	1
My instructional technology professors...					
4. use technologies in the classroom that enhance what they teach, how they teach, and what we [students] learn.	5	4	3	2	1
5. apply strategies that combine content, technologies, and teaching approaches in the classroom.	5	4	3	2	1
6. provide leadership in helping their students to coordinate the use of content, technologies and teaching approaches.	5	4	3	2	1
My education foundation professors...					
7. use technologies in the classroom that enhance what they teach, how they teach, and what we [students] learn.	5	4	3	2	1
8. apply strategies that combine content, technologies, and teaching approaches in the classroom.	5	4	3	2	1
9. provide leadership in helping their students to coordinate the use of content, technologies and teaching approaches.	5	4	3	2	1

APPENDIX C

INSTRUMENT 3

C. PRE-SERVICE TEACHERS' SELF PERCEPTION OF THEIR TEACHER EDUCATORS' TPCK MODELING

Please indicate how you feel about the statement below in terms of the application of your teacher educators' Technological Pedagogical Content Knowledge (TPCK) in instruction by encircling the number opposite each statement..

The legend is as follows: **5 – *Agree and Always apply TPCK (AA)*, 4 – *Agree and Oftentimes apply TPCK (AO)*, 3 – *Agree and Sometimes Apply TPCK (ASS)*, 2- *Agree but Seldom apply TPCK (AS)***, and ***1- Disagree and never apply TPCK (DN).***

TPCK Models					
My literacy education professors...	**5 (AA)**	**4 (AO)**	**3 (ASS)**	**2 (AS)**	**1 (DN)**
1. use technologies in the classroom that enhance what they teach, how they teach and what we [students] learn.	5	4	3	2	1
2. apply strategies that combine content, technologies, and teaching approaches in the classroom.	5	4	3	2	1
3. provide leadership in helping their students to coordinate the use of content, technologies and teaching approaches.	5	4	3	2	1
My instructional technology professors...					
4. use technologies in the classroom that enhance what they teach, how they teach, and what we [students] learn.	5	4	3	2	1
5. apply strategies that combine content, technologies, and teaching approaches in the classroom.	5	4	3	2	1
6. provide leadership in helping their students to coordinate the use of content, technologies and teaching approaches.	5	4	3	2	1
My education foundation professors...					
7. use technologies in the classroom that enhance what they teach, how they teach, and what we [students] learn.	5	4	3	2	1
8. apply strategies that combine content, technologies, and teaching approaches in the classroom.	5	4	3	2	1
9. provide leadership in helping their students to coordinate the use of content, technologies and teaching approaches.	5	4	3	2	1

My professors outside literacy education...	5 (AA)	4 (AO)	3 (ASS)	2 (AS)	1 (DN)
10. use technologies in the classroom that enhance what they teach, how they teach, and what we [students] learn.	5	4	3	2	1
11. apply strategies that combine content, technologies, and teaching approaches in the classroom.	5	4	3	2	1
12. provide leadership in helping their students to coordinate the use of content, technologies and teaching approaches.	5	4	3	2	1
My Grade 1 to 6 cooperating teachers ...					
13. use technologies in the classroom that enhance what they teach, how they teach, and what students learn.	5	4	3	2	1
14. apply strategies that combine content, technologies, and teaching approaches in the classroom.	5	4	3	2	1
15. provide leadership in helping their student-teachers to coordinate the use of content, technologies, and teaching approaches.	5	4	3	2	1

Thank you very much for your time and cooperation. Your valuable inputs will go a long way.

RMC

APPENDIX D

COMMUNICATIONS

UNIVERSITY OF THE PHILIPPINES OPEN UNIVERSITY
Los Baños, Laguna

March 19, 2012

Dr. EDGARDO S. VILLASEÑOR
Executive Director, PNU Lopez, Quezon Campus
Lopez, Quezon

Dear Sir:

The undersigned is a MAEd (Language and Literacy Education) student of the UP Open University, Los Baños, Laguna and, at the same time, a part-time faculty of PNU Quezon Campus. He is conducting a study on — **"Pre-Service Teachers Teaching Reading Efficacy Beliefs, Technological Pedagogical Content Knowledge (TPCK) Levels and Teacher Educators' Modeling,"**

He has selected the graduating preservice elementary teachers of your university to be the respondents. Considering the benefits not only the researcher will derive but also the university, he would like to request an audience with you at your most convenient time for him to discuss briefly the study and to request permission from your good office so that he could make arrangements for field testing, pilot testing and actual administration of the instruments to the aforementioned respondents.

Rest assured that the data gathered will be treated with utmost confidentiality and that a copy of the report of the study will be forwarded to your office as soon as it is completed for your reference.

Your favorable approval and support to this matter will highly be appreciated.

Very truly yours,

(SGD)
REYNALD M. CACHO

Noted:

(SGD)
NEMAH N. HERMOSA, PhD
Adviser