Teachers' Level of Technology Integration Knowledge and Technology Integration in Different Learning Areas

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ABSTRACT

The study aimed to determine the teachers' level of technology integration knowledge and technology integration in different learning areas among teachers in rural school. There were 78 teachers who responded of the survey which was adapted from the TPACK framework questionnaires. The method employed was quantitative descriptive correlational. The statistical tool was mean for the frequency, Pearson moment product for correlation and multiple linear regression were utilized in the analysis of the gathered data. Results revealed that teachers' technology integration knowledge was high with the availability of computers that they utilized in their schools. Science subject was found to be the most integrated subject in terms with technology integration among the different learning areas. Meanwhile, there is a significant relationship that resulted between technology integration knowledge and technology integration in science learning area only. It was recommended the upscaling of teachers through attending technology related seminars and trainings. Stakeholder would upgrade school ICT based resources. Moreover, the proposed enhanced ICT Training be implemented to improve teaching efficiency with respect to TPACK.

Keyword: TPACK framework, technology integration knowledge, ICT Training, teaching efficiency

THE PROBLEM AND RELATED LITERATURE

Introduction

It is generally believed that ICTs can empower teachers and learners, transforming teaching and learning processes from being highly teacher- dominated to student-centered, and that this transformation will result in increased learning gains for students, creating and allowing for opportunities for learners to develop their creativity, problem solving abilities, informational reasoning skills, communication skills, and other higher-order thinking skills. However, teachers of rural elementary schools are confronted with many challenges on how to integrate the technology in their teaching. It seems that teachers are experiencing difficulty in effectively integrating technologies into existing curricula. What could be the reasons for these difficulties? Could it be due to lack of Technology, Pedagogy, Content Knowledge (TPACK)? The fundamental issue is whether teachers know how to use ICT effectively in their teaching. In the global scenario, Nordin (2014) reported that producing teachers who are competent in integrating computer in the subject matter remains an increasing problem among educational institutions. Moreover, in other developing countries, although technology integration is considered as a potential tool that provides educational opportunities in both formal and non-formal ways, the integration of ICT in the actual classroom scenario was poorly achieved (Dela Rosa, 2016). Similar situation in the Philippine context, in the study of Correos (2014) provided evidence that there was only a limited use of ICT in teaching due to the many challenges faced by the teachers that demotivated them from using ICT in class activities. These include lack of knowledge and training on how to use ICT tools. Meanwhile, the Department of Education through DepEd

Order No. 42, s. 2017 has adopted and implemented the Philippine Professional Standards for Teachers (PPST) where the positive use of ICT is mandated. This is based on the ICT competency framework of teachers in ASEAN. It has seven (7) domains where domain no. 1 is about the content knowledge and pedagogy knowledge which include the positive use of ICT. Positive use of ICT means the responsible, ethical and appropriate use of technology. With this domain, the use of ICT plays an interaction of content knowledge, pedagogical understanding and technological competence. Technology had been the trend in the teaching and learning process.

Integrating technology had been encouraged due to the demands for quality instruction, teaching and learning. Teachers have a gigantic role to ascertain the emphasis of the excellence of the delivery of instruction. However, the level of the knowledge of teachers in integrating technology were in question due to the many factors.

In the local scenario, in Marilog District, Davao City, most schools the teachers' knowledge in technology and the emphasis of the application for student technical difficulties for technology integration in all subject areas have become the major problem; source of frustration for teachers especially in the teaching and learning process. The low opportunity to integrate technology in the teaching process decreases students' interest to engage in class discussion, thus, resulting to poor academic achievement among students in the elementary level. The technical difficulties such as unstable source of electricity, low connectivity, virus attack, printer malfunctioning, and lack of technical assistance also resulted to teachers' discouragement from using computer technology during class discussion.

This problem is like the difficulties faced by other schools in rural areas where technical problems become the major barrier for teachers (Türel & Johnson, 2012). Cognizant of this dilemma, schools in Marilog District in Davao City have recognized the importance of technical support to assist teachers to integrate ICT in the classroom.

This study is conducted to find out the teachers' level of technology integration knowledge and technology integration in different learning areas with respect to Technology, Pedagogy, and Content Knowledge (TPACK). Results of this study is beneficial to the teachers, school heads and curriculum planners as it serves inputs to curriculum planning particularly on the integration of ICT in instruction. Hence, this study is of great significance in the process of teaching and learning.

REVIEW OF RELATED LITERATURE

This section provides the discussions of the technology integration knowledge of the teachers in relation to TPACK framework and integration of technology on different learning areas which were taken from different books, journals and electronic files.

Technology Integration Knowledge of the Teachers

Technology integration knowledge as defined by Knolton (2014) is the knowledge and skills of the individual on the use of technology tools in general content areas in education to allow students to apply computer and technology skills to learning and problem-solving. As noted by Roblyer and Doering (2013), technology integration is achieved when knowledge of both the activity structures and types are appropriate for teaching specific content and the manners in which technologies are used as part of the lesson, project, or unit design. Further, Meel (2016) viewed technology integration knowledge as the person's general evaluation or feeling of favor or antipathy towards computer technologies and specific computer related activities.

Meanwhile, Mahajan (2016) reported that the knowledge of the teachers towards computer technology had a significant positive correlation with the method of the teaching adopted by the teacher, the effectiveness of teaching and the support provided by the teacher in learning. Also, Vaseghi, Ramezani, and Gholami (2012) asserted that teachers' knowledge in integrating computer technology in teaching improves student's good

learning styles and confidence in learning. In addition, classroom environment which included satisfaction, friendship and support were the predictor of attitude of students towards technology (Sang, Valcke, van Braak, Tondeur & Zhu, 2012). A study conducted by Gilakjani and Leong (2012) also validated that teachers' positive attitudes and knowledge toward computer integration enhance students' learning to use technologies in learning; negative attitudes constrain it.

In this view, the author further asserted that not only individuals with positive attitudes should be included in technology training activities. It does mean that negative attitudes and less knowledge among participants need to be valued and addressed and that computer knowledge should be encouraged and developed. Hence, Taconis and Jochems (2012) viewed that teacher often recognize that their students do indeed need additional input and output activities to help them continue to improve their language skills, particularly pronunciation skills.

On another study conducted by Abedalaziz, Jamaluddin, and Leng (2013), ICT mediated classroom environment influenced students' positive attitude towards computer usage. Moreover, as cited by Tasir, Mohammad El Amin Abour, Abd Halim, and Harun (2012) in schools where instruction is facilitated with multimedia technology and worldwide networking, students learned in an individually paced manner; there were self-directed learning experiences (i.e.student-centered) and schools have open-ended curriculum. Thus, there was increased students' performance due to the intelligent application of technology that further led to the effectiveness and efficiency of teaching and learning process.

Similarly, Shaukenova (2016) asserted that knowledge of teachers on how to use computers and other ICT related devices improves positive attitude of the students towards computers because it helps them gain thoughtful understanding and familiarization of several educational resource, approaches to evaluating and providing solutions to problems through research works, philosophies, creative activities and tests. Students use computers to help them complete tasks which they regard as problems. As a result, they are likely to have a more positive attitude towards the use of computers and are, likely, to look for further tasks, which can be completed using a computer (Amin, 2014).

On a similar view, Wario (2014) asserted that the actual computer experience developed students' positive attitude towards learning. Likewise, Samarkandi (2012) pointed out that the ability of the teachers to assist and encourage students to use computer technology and multimedia software to learn and retrieve information helps students engaged in learning. It appeals to their needs to be stimulated through their multiple senses. It also allows them to increase their confidence with computer-based technology that transcends all components of their didactic and clinical learning. Binder and Niederle (2012) also noted that knowledge of the teachers to integrate computer technology inside the classroom influenced students' desire to use computers and their desire to enroll in computer-related subjects and courses.

Moreover, the knowledge of the teachers to integrate technology in the teaching process influenced their feeling that computer is manageable to utilize in learning processes (Saricoban, 2013). Abdullah, Ziden, Aman, and Mustafa (2015) also described the affective component of attitude based on emotional experiences or preferences because it was perceived that technology impacts peoples' daily lives and certainly plays an important part in developing individual's positive and negative attitudes.

However, Ali (2012) reported that the lack of computers in the classrooms has led most of the teachers to become unfamiliar with using them and developed low behavioral attitudes towards using computers. Hence, people who have positive affect reactions to an experience with product or service attributes are more likely to evaluate an attitude object favorably (satisfactorily), and people are unlikely to evaluate the attitude object favorably if they experience negative affect reactions (Al Bataineh & Anderson, 2015). Meanwhile, the study of Oye and Lahad (2013) confirmed that positive perceptions not only on the use but also the continuation in using this sort of learning is crucial to nourish individuals' intentions. It demonstrated that knowledge and attitudes do affect

significantly on intentions and that actual e-learning usage produces ample and much-welcomed effects on students' performances in their studies. In this connection, Parker and Lenhart (2012) asserted that continuous e-learning use is indeed associated with students increased academic performance.

Thus, for e-learning and m-learning processes to improve and become more efficient for better students learning outcomes, it is recommended that institutions focus on how the technology involved needs to be, not only adequate, but also indeed, effective to help facilitate the said processes (Wario, 2014).

On a similar view, Lawton, Conner, and McEachan (2012) pointed out that the influence of technology integration knowledge will be strongest for those behaviors that have more immediate impact on the senses or physiological state and weakest amongst behaviors where the impact is less immediate. As noted by Conner, McEachan, Taylor, O'Hara, and Lawton (2015), knowledge and affective qualities are attributed to behaviors because of experiencing the emotion when enacting the behavior and that they guide intention and action. These affective qualities attributed to their behaviors (Adodo, 2012). Various health risk and health protection behaviors are, likely, to have more immediate impact on the senses or physiological state, while various detection behaviors are, likely, to have less immediate impact (Bakr, 2012).

Further, Weng, Yang, Ho, and Su (2018) pointed out that technology integration knowledge impacts teachers' beliefs that using a computer would enhance his or her job performance. Moreover, Briz-Ponce, Pereira, Carvalho, Juanes-Méndez, and García-Peñalvo (2017) perceived that information technology helps promote opportunities of knowledge sharing throughout an organization. These can help individuals having up-to-date information and knowledge. This follows the definition that within an organizational context, people are generally reinforced for good performance by raises, promotions, bonuses, and other rewards. Hence, a system high in perceived usefulness is one for which a user believes in the existence of a positive use-performance relationship.

Furthermore, Suki and Suki, (2011) asserted that people tend to use or not to use a system application to the extent they believe it will help them perform their job better. This means that the user has a perception of how useful the technology is in performing his job tasks (Hoffman, Bertot, & Davis, 2012). As pointed out by Huprich (2016), even if potential users believe that a given application is useful, they may, at the same time, believe that the system is too hard to use. Further, the performance benefits of usage are outweighed by the effort of using the application where usage is thought to be influenced by perceived ease of use.

On a different context, Aboshady, Radwan, Eltaweel, Azzam, Aboelnaga, and Hashem (2015) made clear that perceived control increases teachers' confidence that they have knowledge of how to use computers. Moreover, they can address problems that may occur while using it. Meanwhile, Sarcoban (2013) characterized perceived control as a concept related to person's view on having tendency of getting positive outcomes or avoiding negative results through one's idea. The concept of control has been one of the most pervasive and enduring ideas in psychological research and theory. Renny, Guritno, and Siringoringo (2012) also reported that numerous theories posit the important role in human behavior for control constructs such as self-efficacy, personal causation, effect and motivation, perceived control, and helplessness.

On a study conducted by Mahakalkar (2013), result showed that having a sense of control has consistently been found to have adaptive effects. According to Han, Nelson, and Wetter (2014), perceived control is associated with emotional well-being, reduced physiological impact of stressors, enhanced ability to cope with stress, improved performance, less pain, and a greater likelihood of making difficult behavior changes. Across a variety of environments, from the classroom to the workplace to the medical center, and in diverse populations including children to older adults, it is generally adaptive to have a sense of control (Aboshady, et al., 2015). Thus, low personal control can lead to apathy that depresses the likelihood of any attempts to make positive changes. Furthermore, one control, control over one's own actions, is likely, to play an important role in effective lifestyle changes (Suki & Suki, 2011).

Lu, Lin, and Chen (2017) also pointed out that the interest of the teacher to perform tasks when they know that it involves computer is connected to a person's overt actions in relation to the attitude object. In line with this, Sánchez-Prieto, Olmos-Migueláñez, and García-Peñalvo (2017) viewed involvement as a core concept in explaining individuals' participation in activities and their actions with respect to the attitude object. Involvement has been conceptualized in relation to both products and actions. Further, Wang and Liu (2014) conceptualize involvement as a behavioral commitment differentiated by individuals in term of their activity. In this point of view, involvement is related to a general level of interest in or concern about an issue without reference to a specific position.

Technological, Pedagogical, Content and Knowledge (TPACK)

Technological, Pedagogical, Content and Knowledge (TPACK) is described by Knolton (2014) as what a teacher must know to effectively integrate technology into the curriculum such as teacher practices. It represents the combination of teacher content knowledge (CK), pedagogy knowledge (PK), and technological knowledge (TK) as interrelated. In this sense, Harris, Grandgenett, and Hofer (2012) pointed out that TPACK allows teachers to put into consideration what knowledge is required to integrate technology into teaching and how they might develop that knowledge within themselves. Further, Baran, Chuang, and Thompson (2011) described TPACK as a tool that serves as a useful conceptual framework for thinking, analyzing, and evaluating what teachers must know to integrate technology into teaching. However, it must be understood as a framework for ways in which teachers might best develop this integrated knowledge.

In this connection, Nordin (2014) asserted that TPACK framework is useful in describing the interaction of knowledge about how to teach, what to teach, and how to do so with the use of ICT. Accordingly, both pre-service and in-service teachers are becoming more creative when exposed in a technology-enhanced learning environment. As an example, Wankel and Blessinger (2013) reported that students' engagement in learning increases when teachers were able to combine the use of online lectures and classroom discussion or requiring their students to submit their own wikis or videos. Hence, as a standard practice, pre-service teachers should first be able to understand the linkages between technological knowledge, pedagogical knowledge, and content knowledge before they can become creative in the use of ICT in schools (Koehler & Mishra, 2009).

Meanwhile, on study conducted by Angeli and Valanides (2011) results revealed that the use of the TPACK framework can create an added value since the structure of this model can be used to simplify topics that are not easy for pre- service teachers to understand. Also, Durdu and Dag (2017) express that using the TPACK framework, pre-service teachers can increase their competencies by creating good educational materials and useful instructional material designs that utilize both pedagogical knowledge and ICT. In other words, the TPACK model can equip pre-service teachers with sufficient knowledge and skills needed to fully utilize the available ICT tools in teaching. This explains why the TPACK framework has been considered as a useful tool whenever there is a strong need to understand how pre-service teachers can integrate technology into teaching and learning (Ndongfack, 2015).

On the same context, Akkaya (2016) reported that TPACK framework allows teachers to develop strategies that will be effective for students' learning. To this effect, Mainali and Key (2012) asserted that the TPACK framework enables teachers to effectively integrate the use of ICT in designing content during the planning stage. This simply means that teachers will have to focus first on the lesson content before analyzing how they can effectively integrate the use of technology. In most cases, specific technology will be chosen depending on the type of activity pre-service teachers wants to deliver. In other words, this strategy considers what is expected of students to do in class during and after the lecture discussion. Teachers can shift from content design to the type of activities that will be conducted in class (Baran et al., 2011).

Moreover, Nelson, Christopher and Mims (2011) concluded that teachers who are highly competent in the use of the TPACK framework are the ones who often show higher competency not only in understanding and applying

pedagogy, content, and technology in teaching but also their capability in organizing, collaborating, and developing more opportunities for learning. Since the TPACK framework serves as a useful model in enabling preservice teachers to gain better understanding of the relationship between technology, content, and pedagogy, the use of this framework is important in terms of increasing the ability of teachers to successfully adopt the use of technology in teaching (Angeli & Valanides, 2011).

In addition, Alayyar, Fisser, and Voogt (2012) pointed out that the TPACK framework is considered an important tool because this model was purposely designed to understand and identify effective ways in integrating teachers' knowledge, skills, and attitude.

Technology knowledge. The first domain of Technological, Pedagogy, Content Knowledge (TPACK), technology knowledge, is defined by Hosseini and Kamal (2012) as the knowledge required for using technology tools to achieve various tasks. This includes the knowledge of standard and advanced hardware and software including the ability of individuals to troubleshoot when problems related to technical issues arise. According to Baran et al. (2011), technology knowledge is about effectively managing and maintaining the condition of high-and low-technologies such as wireless broadband, dial-up internet connection, creating digital photos and videos, hardware and software programs, and the management of interactive whiteboards, blackboards, etc. Aside from the ability of tea chers to adop t t he constantly changing technologies, technology knowledge (TK) can also refer to the best way of optimizing students' learning by being able to accurately identify useful technologies that can be used in teaching (Koehler & Mishra, 2009).

Phillips (2014) also argued that teachers should posses a deeper, more essential understanding and mastery of information technology for information processing, communication, and problem solving than does the traditional definition of computer literacy. In contrast to a superficial level of technological literacy, teachers with a deeper understanding of technology knowledge are able to effectively apply technology in their work and personal lives through the recognition of when technology could assist or hinder the achievement of a goal (Koehler & Mishra, 2009). As noted by Olofson, Swallow, and Neumann (2016), this understanding of the difference between technological literacy and technology knowledge (TK) is particularly significant when considering the wicked problem confronting teachers' integration of technology. It promotes the idea of technology knowledge as less of a static, compartmentalized notion but one that evolves as an individual's open-ended interaction with technology changes over time.

Pedagogy Knowledge

The second domain of Technological, Pedagogy, Content Knowledge (TPACK) is defined by Hosseini and Kamal (2012) as the methods or processes of teaching which includes knowledge in classroom management, assessment, lesson plan development, and student learning. As noted by Nordin (2014), this knowledge is about the processes and practices or methods of teaching and learning on how they encompass, among other things, overall educational purposes, values, and aims. Koehler and Mishra (2009) also asserted that pedagogy knowledge (PK) covers classroom management, lesson plan development and implementation, and student evaluation. It includes knowledge about techniques or methods to be used in the classroom, the nature of the target audience, and strategies for evaluating student understanding. It requires an understanding cognitive, social, and developmental theories of learnin g and how it is applied to learners.

According to Graham (2011), pedagogy knowledge includes knowledge about techniques or methods to be used in the classroom, the nature of the target audience, and strategies for evaluating student understanding. In addition, Harris et al. (2012) opined that a teacher with deep pedagogical knowledge understands how students construct knowledge and acquire skills, develop habits of mind and positive dispositions towards learning.

Content Knowledge

According to Baran et al. (2011), content knowledge (CK) refers to knowledge of the subject matter

which teachers are expected to learn and eventually teach their students. This is the knowledge of the major facts and concepts within a field and the relationships among them. Moreover, Koehler and Mishra (2009) asserted that content knowledge (CK) includes the understanding of subjects taught; knowledge of central facts, concepts, theories, and procedures within the given field. This also includes the knowledg e of explanatory frameworks that organizes and connects ideas so with knowledge of the rules of evidence and proof.

In this context, Loughran, Keast, and Cooper (2016) pointed out that teachers who lack subject matter knowledge are limited in their ability to explain or answer questions that are raised by their students. Thus, to ensure that all teachers can answer each of the students' queries in a more logical and rational way, pre-service and in-service teachers should strengthen their knowledge of content (Koehler et al., 2014).

Furthermore, Phillips (2014) contended that teachers must also understand the nature of knowledge and inquiry in different fields so not to misrepresent the content knowledge of these different fields to their students (Hamadeh, 2017). As viewed by Ghavifekr and Rosdy (2015), the teaching of disciplines is the single most important and least-replaceable purpose of schooling. They are like mental furniture on what we think in. Accordingly, disciplines provide four things: knowledge (facts, concepts & relationships); methods (knowledge creation and validation processes); purposes (reasons why the discipline exists); and forms of representation (genres & symbol systems).

Pedagogical Content Knowledge

The fourth domain of Technological, Pedagogy, Content Knowledge (TPACK), is pedagogical content knowledge (PCK). This is described by Hosseini and Kamal (2012) as the understanding of how to teach a particular content to enhance learning and teaching. According to Cavanagh and Koehler (2013), it pertains to the way the content can be represented and formulated to make it comprehensible to others. Commonly used to improve the outcome of the teaching process, PCK combines or integrates the concept of both knowledge of pedagogy and content (Baran et al., 2011). It means that PCK is the knowledge of pedagogy that is applicable to a specific content area. In other words, PCK may also include the need to understand the students' pre-conceptions and misconceptions regarding a specific content area (Koehler & Mishra, 2009).

Technological Content Knowledge

The fifth domain of Technological, Pedagogy, Content Knowledge (TPACK), is Technological Content Knowledge (TCK) described by Hosseini and Kamal (2012) as special knowledge that enables a teacher to select or fit the appropriate technology in the content area. Koehler & Mishra (2009) also describes it as basically "an understanding of the way technology and content influence and constrain one another: Using various technologies, TCK represent specific subject matter (Baran, Chuang, & Thompson, 2011).

Technological Pedagogical Knowledge

The sixth domain of Technological, Pedagogy, Content Knowledge (TPACK) is described by Hosseini and Kamal (2012) as the knowledge of technology tools that can enhance learning and teaching. Technological Pedagogical Knowledge (TPK) is a clear understanding on how preservice teachers can effectively apply technology in their teaching approach and practices (Baran et al., 2011). Therefore, technological pedagogical knowledge (TPK) is knowledge on how to improve teaching and learning processes when technologies are being fully utilized (Koehler, Shin, & Mishra, 2012). In some cases, Alayyar, Fisser and Voogt (2012) pointed out that technological pedagogical knowledge (TPK) can also address how pedagogies change while using ICT.

Technological Pedagogical Content Knowledge

The seventh domain of Technological, Pedagogy, Content Knowledge (TPACK) is described by Hosseini and Kamal (2012) as the knowledge in integrating technology into teaching in the content area. Specifically,

Phillips (2017) pointed out that the Technological Pedagogical Content Knowledge (TPCK) arises out of the intersection between the knowledge of content, technology, and pedagogy which can be defined as knowing how to represent subject matter with technology in pedagogically sound ways. Applicable to all in-service and pre- service teachers, the process of developing knowledge of technology, pedagogy and content is important to meet the challenges when integrating ICT into classroom instruction (Nordin, 2014).

The literature in this study that is composed of theories and investigations on technology integration knowledge and technology integration in different learning areas significantly positioned the context of the study. These formed the concepts deemed important in designing framework of the study.

Theoretical Framework

The study is anchored on Mishra and Koehler's (2006) TPACK framework that focuses on technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). This emphasized a productive approach to many of the dilemmas that teachers face in implementing educational technology (edtech) in their classrooms. According to the TPACK framework, specific technological tools (hardware, software, applications, associated information literacy practices, etc.) are best used to instruct and guide students toward a better, more robust understanding of the subject matter. The three types of knowledge – Technology Knowledge (TK), Pedagogy Knowledge (PK), and Content Knowledge (CK) – are thus, combined and recombined in various ways within the TPACK framework. In support, Knolton (2014) also proposed that TPACK framework is useful in describing the interaction of knowledge about how to teach, what to teach, and how to do so with the use of ICT. Accordingly, both pre-service and in-service teachers are becoming more creative when exposed in a technology-enhanced learning environment. Using the TPACK framework, pre-service teachers can increase their competencies in creating good educational materials and useful instructional material designs that can utilize both pedagogical knowledge and ICT (Durdu & Dag, 2017).

Phillips (2014) also postulated that teachers should posses a deeper, more essential understanding and mastery of information technology for information processing, communication, and problem solving. Accordingly, teachers with a deeper understanding of technology knowledge effectively apply technology in their work and personal lives through the recognition of when technology could assist or hinder the achievement of a goal.

Conceptual Framework

The study is composed of two variables. The independent variable is the technology integration knowledge, while the dependent variable is subject area integration. Below is a schematic diagram in which relationship is a hypothesized causal chain wherein one variable affects a second variable. The direct effect represents the relationship between technology integration knowledge and subject area integration resulting to a training program design. The independent variable of this study is technology integration knowledge or the knowledge and skills of the teacher on the use of technology tools in general content areas in education to allow students to apply computer and technology skills to learning and problem-solving (Knolton, 2014). With respect to Technology, Pedagogy, and Content Knowledge (TPACK), Hosseini and Kamal (2012) proposed that the domains of technology integration knowledge are technology knowledge or the knowledge required for using technology tools to achieve various tasks; pedagogy knowledge or themethod or process of teaching includes knowledge in classroom management, assessment, lesson plan development, and student learning; content knowledge or the knowledge of the subject matter is what teachers are expected to learn and eventually teach their students; technological content knowledge or the special knowledge which enables a teacher to select or fit the appropriate technology in the particular content area; pedagogical content knowledge is the understanding of how to teach a particular content to enhance learning and teaching; technological pedagogical knowledge or the knowledge of technology tools which enhances learning and teaching; and technological pedagogical content knowledge is the knowledge that a teacher requires for integrating technology into teaching in the particular content area.

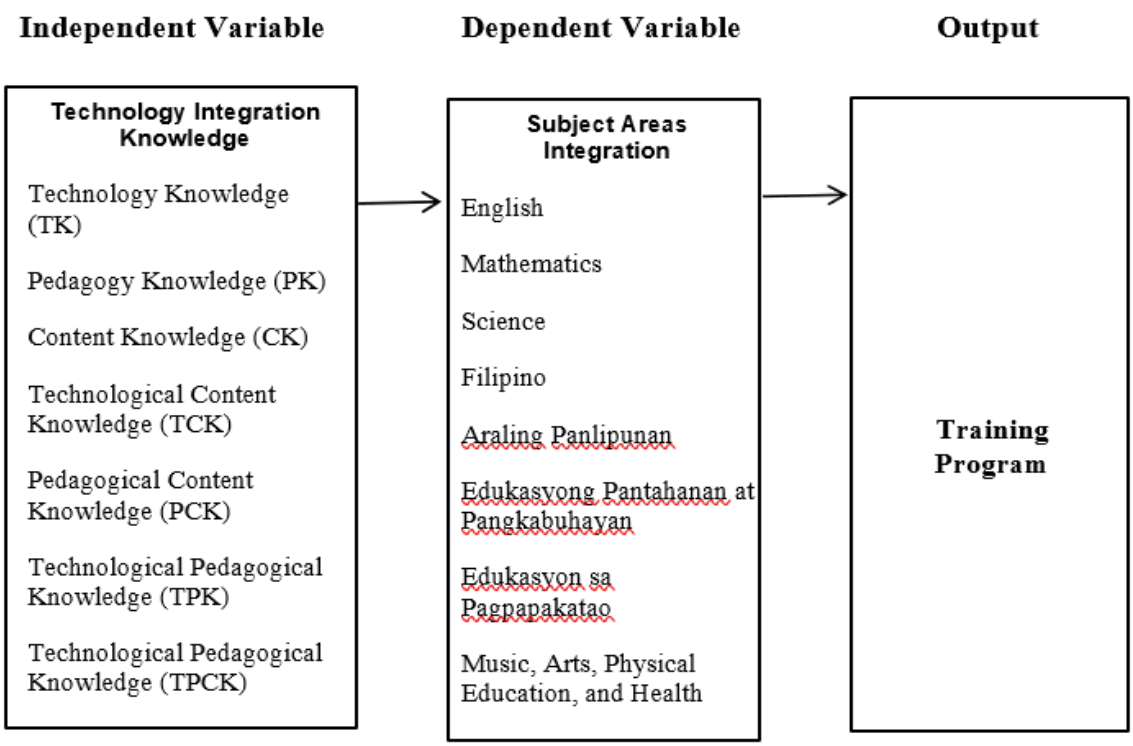

Figure 1. The conceptual framework

Meanwhile, the dependent variable is the technology integration in different learning areas, specifically, English, Mathematics, Science, Filipino, Araling Panlipunan, ESP, EPP and MAPEH.

Statement of the Problem

The focus of this research was to determine the significant relationship between technology integration knowledge and technology integration in different learning areas of the teachers in rural areas. Specifically, the study has the

following objectives:

1. What is the level of technology integration knowledge of the teachers in rural schools with respect to Technology, Pedagogy, and Content Knowledge (TPACK) in terms of:

1.1 technology knowledge;

1.2 pedagogy knowledge;

1.3 content knowledge

1.4 technological content knowledge;

1.5 pedagogical content knowledge;

1.6 technological pedagogical knowledge; and

1.7 technological pedagogical knowledge?

2. How often do teachers integrate technology in the following subject areas:

2.1 English;

2.2 Mathematics;

2.3 Science;

2.4 Filipino;

2.5 Araling Panlipunan;

2.6 Edukasyon sa Pagpapakatao;

2.7 Edukasyong Pantahanan at Pangkabuhayan;

2.8 Music, Arts, Physical Education, and Health?

3. Is there a significant relationship between Levels of Teachers' Technological Knowledge and Teachers Technology Integration in different Learning Areas?

4. What Training Program will be given to the teachers?

Hypothesis

The null hypothesis was tested at 0.05 level of significance.

H0 There is no significant relationship between Levels of Teachers' Technological Knowledge and Teachers Technology Integration in different Learning Areas.

METHODOLOGY

Presented in this chapter are the discussions on research design, research respondents, research instrument, data gathering procedure, data analysis, and ethical consideration.

Research Design

In this study, quantitative design utilizing correlational technique of research was used to gather data such as ideas, facts, and information to achieve the main objective of the study. According to Creswell (2013), quantitative research is a systematic empirical investigation of observable phenomena via statistical, mathematical, or computational techniques. It is conclusive in its purpose as it tries to quantify the problem and understand how prevalent it is by looking for projectable results to a larger population.

Further, correlational research according to Myers and Well (2013) examines how the independent variable influences the dependent variable and establishes cause and effect relationship between variables. In this study, the relationship between the two variables, technology integration knowledge and technology integration in different learning areas were sought. Moreover, the study investigated the level of technology integration knowledge and the learning areas where technology is often integrated. The use of descriptive correlation was appropriate because the researcher only focused on the behavioral aspect of the respondents and no experiment was performed in controlled set-up.

Research Respondent

The respondents of the study were the elementary teachers at the schools in Marilog District, Division of Davao City, Philippines. The sample size for the selection of the respondents was 78 which was taken from the total

number of teachers in the schools located in Marilog District. These respondents representing the teachers from the schools were gathered in order to compute the sample size of on Slovin formula which was used.

This is appropriate because the sample was taken from a large population and there was a need to consider the confidence levels and margins of error. In this study, the 78 respondents were selected through stratified random sampling technique. Stratified random sampling is a method of sampling that involves the division of a population into smaller sub-groups known as strata. According to Shi (2015), in stratified random sampling, or stratification, the strata are formed based on members' shared attributes or characteristics such as income or educational attainment. This is appropriate because there is heterogeneity in a population that can be classified with ancillary information.

The selection of respondents was based on the following criteria: teachers who are permanent-regular regardless of the length of service and handling regular classes from kinder to grade 6 level. Otherwise, school heads, SPED teachers, ALS teachers, auxiliary services personnel, parents, and learners were not part of this study.

Research Instrument

The research instrument used in the study was adapted and modified to suit the current investigation. The first part is about the technology integration knowledge of the teachers which was adapted from the study of Hosseini and Kamal (2012). Technology integration knowledge is indicated with technology knowledge, pedagogy knowledge, content knowledge, technological content knowledge, pedagogical content knowledge, technological pedagogical knowledge, and technological pedagogical content knowledge. The questionnaire consists of 52 items where a 5-point Likert scale was used with the following ranges of means as shown below:

Range of Mean	Descriptive Level	Interpretation
4.20 - 5.00	Very High	Technology integration knowledge among teachers is always evident.
3.40 – 4.19	High	Technology integration knowledge among teachers is oftentimes evident.
2.60 – 3.39	Moderate	Technology integration knowledge among teachers is sometimes evident.
1.80 – 2.59	Low	Technology integration knowledge among teachers is seldom evident.
1.00 – 1.79	Very Low	Technology integration knowledge among teachers is never evident.

Meanwhile, the second part of the questionnaire deals with technology integration in different learning areas. This is composed of 16 statements divided into eight parts namely: English, Mathematics, Science, Filipino, Araling Panlipunan, Edukasyon sa Pagpapakatao, Edukasyong Pantahanan at Pangkabuhayan, Music Arts, Physical Education, and Health. The scaling was done by having one-half of the value of 4 as average cut-off point or the fair level, with a uniform interval of 0.75. The researcher-made instrument also used the 5-point Likert scale with the following ranges of means as shown below:

Range of Mean	Descriptive Level	Interpretation
3.25 – 4.00	Always	Technology integration in different learning areas is always evident.
2.50 – 3.24	Often	Technology integration in different learning areas is often evident.
1.75 – 2.49	Seldom	Technology integration in different learning areas is seldom evident.
1.00 – 1.74	Never	Technology integration in different learning areas is never evident.

Data Gathering Procedure

To gather the needed information, the following steps were observed: First permission to conduct the study was secured from the Dean of the Graduate School of the College of Education in the University of Southeastern Philippines, Obrero St., Davao City. The endorsement letter from the Dean of the Graduate Study in University of Southeastern Philippines was attached to the permission letters and was sent to the Schools Division Superintendent of Davao City to ask permission to conduct the survey. Upon the approval of the Schools

Division Superintendent, another permission letter with attached approval letter from the Superintendent was sent to the district supervisor of Marilog District Davao City and schools heads of the schools where the study was conducted. Second, the researcher considered the protocol for the distribution of the research instrument. During the distribution of the research questionnaires, the researcher ensured that the guidelines issued by the Office of Schools Division Superintendent were strictly followed. The researcher personally administered and retrieved the survey questionnaire to the respondents of every school. During the distribution of the research instrument, the research simultaneously gave the instruction for the completion of the survey. After the administration of the survey questionnaire, the researcher collected and recorded the data for statistical analysis.

Data Analysis

This section contains the statistical tools utilized in the study.

Mean and Standard Deviation. This were used to characterize the technology integration knowledge and technology integration in the different learning areas among the teachers in Marilog District, Division of Davao City.

Pearson Moment Product Correlation. This determined the significant relationship between technology integration knowledge and technology integration in different learning areas among the teachers in Marilog District, Division of Davao City.

Multiple Linear Regression. This determined the learning areas where the teachers integrated technology.

Ethical Consideration

The researcher observed promptly the protocols deemed necessary in carrying out the research study, particularly in managing the population and data. Strict ethical guidelines to uphold participants' privacy, confidentiality, dignity, rights and anonymity were also observed, as follows:

Informed Consent - Prior the conduct of the study, the respondents, the Schools Division Superintendent, and other authorities were personally oriented of the purpose, nature, data collection methods, and extent of the research prior to commencement. The researcher obtained informed consent through writing.

Voluntary Participation - The researcher made it clear to the participants that the research was only for academic purposes and their participation was voluntary. To address this, consent for voluntary participation in the research for the participants of the study was secured. The purposes and benefits of the study were also discussed to the participants and the rights of the participants to contribute to the body of knowledge was carefully considered and adhered upon.

Privacy, Confidentiality and Anonymity – Respondents were also assured of their confidentiality and anonymity. Pseudonyms were used to ensure that participants' identities could not be recognized.

Harm and Risk - It was emphasized tha t no participants will be pu t in a situation where they might be harmed because of their participation. Further, if the respondents would have withdrawn his/her participation for any reason/s, the respondents would be free from any liabilities and will be given consideration. In addition, in the event that the respondent will become upset or distressed as a result of answering the questions, they will be offered help in obtaining a referral for the participants to see a trained professional who can help process these feelings.

Plagiarism - The researcher made sure that there is no misrepresentation of someone else's work as my own work throughout the study. However, in the case that some ideas were left not cited with proper author, it was assured that it was unintentional, and the manuscript will be immediately revised.

Fabrication - It was also ensured that the rightful author and sources were cited in the study. There was no making up of data and/or results, or purposefully putting forward conclusions that are not accurate. However, if any misinterpreted data or inconsistency in the literature occur, it was assured that it was unintentional, and the researcher would immediately revise the manuscript.

Falsification - To avoid falsification, it was ensured that there will be no misrepresentation of the work to fit a model or theoretical expectation. The researcher avoided over claiming or exaggerations of data and concerns were addressed to the qualified authorities. No documents were subject for falsification.

Deceit - It was made sure that the benefit of misleading the respondents outweigh any potential harm to them. The participants were provided adequate information and assurances about taking part to allow them to fully understand the importance of participation. Decisions were on their own free will about whether to do so and must be free from any coercion.

Observation - The researcher adhered on the provisions to address an ethical issue in observing people in public or quasi-public place. Prior to the conduct of the study, the researcher placed notices at the entrance of the area of the survey indicating that they would be operating in the particular area during the interview on each participant.

Conflict of Interest (COI) - The researcher declared no conflict of interest during the conduct of the study. The validity of the research was not influenced by any secondary interest such as financial or academic gains or recognition.

RESULTS AND DISCUSSION

Presented in this chapter are the results generated from the data gathered and statistical analysis. It also provides the interpretation and analysis of the data.

Level of Technology Integration Knowledge of Teachers

The technology integration knowledge of teachers in rural schools is indicated with technology knowledge, pedagogy knowledge, content knowledge, technological content knowledge, pedagogical content knowledge, technological pedagogical knowledge, and technological pedagogical content knowledge.

Table 1. Level of Technology Integration Knowledge of the Teachers

Indicators	*S.D*	*Mean*	*Descriptive Rating*
Content Knowledge	0.34	4.23	Very High
Technology Knowledge	0.35	4.14	High
Pedagogical Content Knowledge	0.37	4.06	High
Pedagogy Knowledge	0.43	3.89	High
Technological Content Knowledge	0.41	3.86	High
Technological Pedagogical Knowledge	0.24	3.85	High
Technological Pedagogical Content Knowledge	0.28	3.84	High
Overall	***0.23***	***4.05***	***High***

The descriptive statistical analysis on the technology integration knowledge of the teachers in rural schools presented on Table 1 obtained an overall mean score of 4.05 with a descriptive rating of high. The cited overall mean score is the result obtained based on the mean scores of 4.23 or very high for content knowledge, 4.14 or high for technological knowledge, 4.06 or high for pedagogical content knowledge, 3.89 or high for pedagogy knowledge, 3.86 or high for technological content knowledge, 3.85 or high for technological pedagogical knowledge, and 3.84 or high for technological pedagogical content knowledge.

The high descriptive rating on technology integration knowledge of the teachers in rural schools denotes that they oftentimes exhibit knowledge and skills on the use of technology tools in general content areas in education which allow students to apply computer and technology skills to learning and problem-solving.

Despite being in rural areas, it could be implied on the result that the high level of technology integration knowledge could be attributed to the Department of Education in providing the schools with computer equipment. Further, it was revealed in the findings that teachers were able to teach lessons and use strategies that appropriately combined topics, technologies and teaching approaches, selected technologies that enhance teaching and students' learning, and provided leadership in helping others to coordinate the use of particular topics, technologies and teaching approaches.

Thus, these practices are expected to improve the technology integration knowledge of the teachers. The finding also validates the views of various authors (Baran, Chuang, & Thompson, 2011; Harris, Grandgenett, & Hofer, 2012) who underpinned the fact that TPACK could serve as a tool for thinking, analyzing, and evaluating what teachers must know to integrate technology into teaching. It also allows teachers to put into consideration what knowledge is required to integrate technology into teaching and how they might develop that knowledge within themselves.

Table 1.1. Level of Technology Integration Knowledge in terms of Content Knowledge of the Teachers

Statements	S.D	Mean	Descriptive Rating
1. I have sufficient knowledge about the particular content of the subject matter I am teaching in elementary level.	0.82	4.40	Very High
2. I can use the subject matter I taught as the way of thinking.	0.88	4.01	High
3. I have various ways and strategies of developing understanding on the subject matter I am handling.	0.81	3.58	High
4. I have sufficient knowledge about structure of knowledge of the subject matter I am teaching in elementary level.	0.89	4.77	Very High
5. I know concept, facts, theories and procedures within the subject matter I am teaching in elementary level	0.94	3.97	High
6. I believe in the validity and reliability of the content of the subject matter.	0.93	4.67	Very High
Mean	**0.43**	**4.23**	**Very High**

On Table 1.1, results reveal that technology integration knowledge in terms of *content knowledge* obtained the highest mean score of 4.23 or very high. The very high rating on this indicator is the result of the very high rating assigned by the respondents on the following descriptors: having sufficient knowledge about the content of the subject matter and structure of knowledge of the subject matter and believing in the validity and reliability of the content of the subject matter.

Meanwhile, the very high-level rating on some items indicated that the teachers are already acquainted with technology due to its availability in the schools. The high level of technology integration knowledge in terms of content knowledge indicates that teachers have mastered the subject matters they taught. This study is congruent to the findings of Koehler and Mishra (2009) that content knowledge includes the understanding of subjects taught, knowledge of central facts, concepts, theories, and procedures within a given field.

In a similar vein, the finding is also in line with the view of Phillips (2014) that teachers must understand the nature of knowledge and inquiry in different fields. Teachers who do not have these understandings can misrepresent the content knowledge of these different fields to their students. Likewise, Serdyukov (2017) asserted that disciplines are powerful because through a process of developing knowledge, methods, purpose and representation, they allow learners to see.

Table 1.2. Level of Technology Integration Knowledge in terms of Technology Knowledge of the Teachers

Statements	S.D	Mean	Descriptive Rating
1. I know how to solve my own technical problems.	0.88	4.46	Very High
2. I can learn technology easily.	1.22	3.72	High
3. I play around technology.	0.93	4.13	High
4. I know about lot of different technologies.	0.60	4.00	Very High
5. I have the technical skills needed to use technology.	0.88	4.42	High
6. I have sufficient opportunities to work with different technologies.	0.76	3.58	Very High
7. I can use technology tools to process data and report results.	0.55	4.54	Very High
8. I can use technology in the development of strategies for solving problems in the real world.	1.06	4.23	Very High
9. I can design web pages and use authoring software.	0.78	3.90	High
10. I understand legal, ethical, cultural, and societal issues related to technology.	0.88	4.46	Very High
Mean	**0.35**	**4.14**	**High**

Meanwhile, on Table 1.2 results reveal that the high descriptive rating was given on technology integration knowledge in terms of *technology knowledge with a* mean score of 4.14. This covers the following: learning technology easily, playing around technology, knowing about lot of different technologies, having sufficient opportunities to work with different technologies, designing web pages and using authoring software. This finding is similar to the view of Olofson, Swallow, and Neumann (2016) that technology knowledge promotes the idea of technology knowledge as less of a static, compartmentalized notion but one that evolves as an individual's open-ended interaction with technology changes over time.

The findings also coincide with the view of Baran et al. (2011) that technology knowledge is about effectively managing and maintaining the condition of high-and low-technologies including ICT such as wireless broadband, dial-up internet connection, creating digital photos and videos, hardware and software programs, and the management of interactive whiteboards, blackboards, etc.. Aside from the ability of the teachers to adopt the constantly changing technologies, technology knowledge (TK) can also refer to the best way of optimizing students' learning by being able to accurately identify useful technologies that can be used in teaching.

Further, results on Table 1.3 show that technology integration knowledge in terms of *pedagogical content knowledge* obtained a mean score of 4.06 or high. The high descriptive rating on this indicator indicates that respondents oftentimes perceive the following descriptors: knowing the purpose and objectives for the subject matter, being able to manage my students' learning about the subject matter, having the curricular knowledge (horizontal and vertical) of the subject matter, and knowing prior knowledge of students about the subject matter.

Table 1.3. Level of Technology Integration Knowledge in terms of Pedagogical Content Knowledge of the Teachers

Statements	S.D	Mean	Descriptive Rating
1. I know how to select effective Teaching approaches to guide students' thinking and learning in the subject matter I am teaching in elementary level.	1.03	3.64	High
2. I know the purpose and objectives for the subject matter I am teaching in the elementary level.	0.93	4.19	High
3. I can manage my students' learning about the subject matter I am teaching in the elementary level.	0.96	3.79	High
4. I have the curricular knowledge (horizontal and vertical) of the subject matter that I am handling.	1.02	4.04	High
5. I know instructional strategies that are suitable for the topic on the subject matter that I am handling.	1.12	3.78	High

6. I know prior knowledge of students about the subject matter that I am handling.	0.96	4.31	Very High
7. I know how and what to assess on the subject matter I am teaching in elementary level.	0.62	4.64	Very High
Mean	**0.37**	**4.06**	**High**

This finding is congruent to the view of Cavanagh and Koehler (2013) on pedagogical content knowledge (PCK) where it pertains to the manner in which the content can be represented and formulated to make it comprehensible to others.

Table 1.4. Level of Technology Integration Knowledge in terms of Pedagogy Knowledge of the Teachers in Rural Schools

Statements	S. D	Mean	Descriptive Rating
1. I know how to assess student performance in a classroom.	0.82	3.71	High
2. I can adapt my teaching based-upon what students currently understand or do not understand.	0.88	4.42	Very High
3. I can use a wide range of teaching approaches in a classroom setting (collaborative instruction, learning, direct instruction, inquiry learning, problem/project-based learning)	0.81	3.64	High
4. I am familiar with common student understanding and misconceptions.	0.89	3.74	High
5. I know how to organize and maintain classroom management.	0.94	3.49	High
6. I can assess student learning in multiple ways.	0.93	4.13	High
7. I can adapt my teaching style to different learners.	1.07	4.12	High
Mean	**0.43**	**3.89**	**High**

Furthermore, technology integration knowledge in terms of *pedagogy knowledge* obtained a mean score of 3.89 or high on the following items: assess student performance in a classroom, using a wide range of teaching approaches in a classroom setting, being familiar with common student understanding and misconceptions, knowing how to organize and maintaining classroom management, assessing student learning in multiple ways, and adapting teaching style to different learners. The result agrees with the view of Harris and Hofer (2011) that pedagogy knowledge is involved in all issues of student learning, classroom management, lesson plan development and implementation, and student evaluation. Likewise, the finding is also in agreement with the view of Harris et al. (2012) that a teacher with deep pedagogical knowledge understands how students construct knowledge and acquire skills; develop habits of mind and positive dispositions towards learning.

Table 1.5. Level of Technology Integration Knowledge in terms of Technological Content Knowledge of the Teachers

Statements	S. D	Mean	Descriptive Rating
1. I know about technologies that I can use for understanding the subject matter I am teaching in elementary level.	0.88	4.46	Very High
2. I know how to use specific software and Web sites about the subject matter I am teaching in elementary level.	0.91	3.47	High
3. I can find and evaluate the resources that I need for the subject matter I am handling.	0.88	4.15	High
4. I can use technology for presenting the subject matter I am teaching in elementary level.	1.03	3.28	Moderate
5. I can use technology tools and resources for managing and communicating information of the subject matter I am teaching in elementary level.	0.82	3.91	High
Mean	**0.41**	**3.86**	**High**

On Table 1.5, the mean score of 3.86 or high is on technology integration knowledge in terms of *technological content knowledge.* The high rating was acquired due to the high rating on the items on this particular indicator which includes knowing how to use specific software and Web sites, finding and evaluating the resources that are needed for the subject matter, using technology for presenting the subject matter, and using technology tools and resources for managing and communicating information of the subject matter. This finding is in support to the notion of Baran, Chuang and Thompson (2011) that TCk is about the knowledge of technology which can be used in representing specific subject matter.

Table 1.6. Level of Technology Integration Knowledge in terms of Technological Pedagogical Knowledge of the Teachers

Statements	S. D	Mean	Descriptive Rating
1. I can choose technology that can enhance the teaching approaches for a lesson.	0.80	3.45	High
2. I can choose technology that enhances students' learning for a lesson.	0.85	4.18	High
3. I am thinking critically about how to use technology in my classrooms.	1.03	3.29	Moderate
4. I can adapt the use of the technologies that I am learning about the different teaching activities.	0.60	4.00	High
5. My teacher education program has caused me to think deeply on how technology could influence the teaching approaches I use in the classroom.	0.94	3.97	High
6. I can use technology resources to facilitate higher order thinking skills including problem solving, critical thinking, decision making, knowledge and creative thinking.	0.76	3.58	High
7. I can use technology tools and information resources to increase productivity.	0.89	4.01	High
8. I can fuse technology to strategies of teaching.	0.76	3.58	High
9. I can use technology for more collaboration and communication with students and co-teachers.	0.81	4.42	Very High
10. I know how to use technology to facilitate learning.	0.90	3.97	High
Mean	**0.24**	**3.85**	**High**

Moreover, results on Table 1.6 show that technology integration knowledge in terms of *technological pedagogical knowledge* obtained a mean score of 3.85 or high. The said descriptive rating were on the following descriptors: choosing technology that can enhance the teaching approaches and students' learning for a lesson, adapting the use of the technologies to different teaching activities, thinking that teacher education program has caused to thinking deeply on how technology could influence the teaching approaches used in the classroom, using technology resources to facilitate higher order thinking skills, using technology tools and information resources to increase productivity, fusing technology to strategies of teaching, and knowing how to use technology to facilitate learning.

The finding is congruent to the view of Koehler, Shin and Mishra (2012) that technological pedagogical knowledge (TPK) is about having knowledge on how to improve teaching and learning processes when technologies are being fully utilized. Lastly, technology integration knowledge in terms of *technological pedagogical content knowledge* obtained the lowest mean score of 3.84 which is also described as high. The results as shown in Table 1.7 is acquired due to the high rating assigned on the following descriptors: being able to select technologies and strategies to use in my classroom that enhance teaching and students' learning, providing leadership in helping others to coordinate the use of technologies and teaching approaches, using technologies that enhanced learning, evaluating, and selecting new information approaches and technological innovations based on their appropriateness on specific tasks in particular content, using specific tools to support learning research. This result agrees to the proposition of Phillips (2017) that (TPCK) arises out of the intersection between the knowledge of content, technology, and pedagogy which allow teachers to meet challenges when integrating ICT into classroom instruction.

Table 1.7. Level of Technology Integration Knowledge in terms of Technological Pedagogical Knowledge of the Teachers

Statements	S.D	Mean	Descriptive Rating
1. I can teach lessons that appropriately technologies approaches.combine and (content), teaching	1.03	3.29	Moderate
2. I can select technologies to use in my classroom that enhance what I teach, how I teach and what students learn.	0.60	4.00	High
3. I can use strategies that combine (content), technologies and teaching approaches that I learned about my coursework in my classroom.	0.94	3.97	High
4. I can provide leadership in helping others to coordinate the use of (content), technologies and teaching approaches at my school and/or district.	0.76	3.58	High
5. I can use technologies that enhance learning of (the content) for a lesson.	0.89	4.01	High
6. I can evaluate and select new information approaches and technological innovations based on their appropriateness on specific tasks in particular content or topic.	0.95	4.04	High
7. I can use (content) specific tools (e.g., software, simulation, environmental calculator, probes, graphing exploratory environments, Web Tools) to support learning research.	0.90	3.97	High
Mean	**0.28**	**3.84**	**High**

Technology Integration in Different Learning Areas

The frequency of technology integration in different learning areas is presented in Table 2. The results on the table indicate that technology integration in different learning areas obtained an overall mean score of 3.26 indicating that technology integration in different learning areas is always evident. The cited overall mean score is the result obtained based on the mean scores of 3.24 or often for *English,* 3.22 or often for *Mathematics*, 3.66 or always for *Science*, 3.11 or often for *Filipino,* 3.21 or often for *Araling Panlipunan,* 3.24 or often for *ESP*, 3.20 or often for *EPP,* and 3.23 or often for *MAPEH.*

Table 2. Technology Integration in Different Learning Areas

Indicators	S.D	Mean	Descriptive Rating
English	0.56	3.24	Often
Mathematics	0.51	3.22	Often
Science	0.32	3.66	Always
Filipino	0.54	3.11	Often
Araling Panlipunan	0.59	3.21	Often
Edukasyon sa Pagpapakatao	0.52	3.24	Often
Edukasyong Pantahanan at Pangkabuhayan	0.55	3.20	Often
Education, and Health	0.55	3.23	Often
Overall	**0.35**	**3.26**	**Always**

Further, the results in the table indicate that among the learning areas, teachers always integrate technology in the Science subject. This finding supports that teacher always employ student-centered activities and students apply technology tools and resources to manipulate laboratory equipment to aid learning. This finding agrees with the view of Mahajan (2016) pointing out that with positive experiences being with technology, they can potentially cultivate and facilitate learning experiences; it could also improve the student's learning motivation. When students are engaged in computers, system applications and social media, they become more engaged in the learning process in such a way that they could help them monitor progress as they work on the task and get instant feedback from friends and family on their tasks which might help develop their artistic abilities. In line with the TPACK framework, Alayyar et al. (2012) pointed out that the framework is essential

because this model was purposely designed to help users understand and identify effective ways in which teachers' knowledge, skills, and attitude in becoming ICT integrating teachers can increase.

Significant Relationship Between Technology Integration Knowledge and Technology Integration in Different Learning Areas

The results on the relationship between technology integration knowledge and technology integration in different learning areas are presented in Table 3 Figures reveal that there is a significant relationship between technology integration knowledge and technology integration in science learning area as evident on the coefficient of correlation value of 0.289 and significant value less than 0.05. Thus, the null hypothesis of no significant relationship between technology integration knowledge and technology integration in different learning areas, therefore, was rejected.

Table 3. Significant Relationship Between Technology Integration Knowledge and Technology Integration in Different Learning Areas

Variables	Technology Integration Knowledge		
	r-value	p-value	Decision
English	0.005	0.965	Accept H0
Mathematics	0.066	0.568	Accept H0
Science	0.289*	0.010	Reject H0
Filipino	-0.046	0.691	Accept H0
Araling Panlipunan Edukasyon sa	-0.007	0.950	Accept H0
Pagpapakatao Edukasyong Pantahanan at	0.065	0.573	Accept H0
Pangkabuhayan Music, Arts, Physical	0.008	0.944	Accept H0
Education, and Health	-0.107	0.350	Accept H0

The finding indicates that knowledge on integration of technology increases students' persistence on the school tasks. It is consistent with the view of Tasir et al. (2012) that students were able to manage their schoolwork while interacting in virtual world that resulted to a more effective learning environment. In line with the TPACK framework, Alayyar, Fisser, and Voogt (2012) pointed out that the use and integration of technology is an effective strategy where teachers' knowledge, skills, and attitude can increase.

In support, results of linear regression analysis presented in Table 4 showed that among the different learning areas, teachers mostly integrate technology in science as evident in the regression coefficient value of 0.220 with $p<0.05$. This means that a unit of increase in technology integration knowledge corresponds to 0.220 units increase in the technology integration in science learning area.

Table 4. Significance on the Influence of Technology Integration Knowledge on the Technology Integration in Different Learning Areas

Technology Integration Knowledge	Technology Integration in Different Learning Areas				
	B	Beta	S.E	p-value	Decision
English	0.027	0.064	0.076	0.725	Accept H0
Math	0.066	0.145	0.084	0.435	Accept H0
Science	**0.220***	0.299	0.088	**0.015**	Reject H0
Filipino	-0.041	-0.096	0.107	0.701	Accept H0
Araling Panlipunan Edukasyon sa	-0.026	-0.066	0.062	0.677	Accept H0
Pagpapakatao Edukasyong	0.011	0.024	0.084	0.897	Accept H0
Pantahanan at Pangkabuhayan	0.029	0.069	0.117	0.804	Accept H0
Music, Arts, Physical Education, and Health	-0.072	-0.168	0.068	0.296	Accept H0

*Significant @ $p<0.05$

Thus, the results affirmed that the teachers' technology integration knowledge is a function of technology integration in science learning area. The finding emphasized that the attribute of technology integration knowledge enables the teachers to use a system application or computer hardware to the extent that they believe it will help them perform their science teaching tasks better. This finding is in line with the view of Nordin (2014) which pointed those teachers are becoming more creative when exposed in a technology-enhanced learning environment.

Wankel and Blessinger (2013) also suggested that aligning teaching on TPACK increases students' engagement in learning because teachers were able to combine the use of online lectures and classroom discussion. They also required their students to submit their own wikis or videos.

Further, it was also found that with the use of technology teachers become more knowledgeable on various topics. Downloading videos clarified concepts which were misleading. They learned things that were not taught during their college years. The teachers indicated that with the use of computers and system applications, they could find new approaches to execute teaching tasks in the classroom. They also found that students become more participative in class discussions because topics become appealing to their senses.

Training Program to Improve Teaching Efficiency with Respect to TPACK

Technology integration knowledge is a function that predicts technology integration in subject areas. Considering that among the subject areas, it is only in science where integration is always practiced, it becomes rational if more trainings for teacher exposure to the use of technology should be conducted. In doing so, teachers will be adept in the various online applications. Capacitating teachers will not only address materials production but also enhance the teaching and learning with the use of technology. Hence the proposed Advance ICT Literacy Training is deemed of importance.

l. Title: ADVANCE ICT TRAINING PROGRAM FOR TEACHERS in Marilog

District

ll. Date: August 2-6, 2021

lll. Fund Source: MOOE

lV. Speakers: Jerry Montes, Reah Gomez, Diana Rio, and Michelle Lopez

V. Rationale.

Based on the findings on technology integration knowledge and integration on different learning areas, there is a need for the teachers to be properly equipped with ICT skills that are essential in the delivery of the subject matter.

Information and Communications Technology (ICT) can impact student learning when teachers are digitally literate and they understand how to integrate them in the curriculum. Thus, there is a need for schools to use a diverse set of ICT tools to communicate, create, disseminate, store, and manage information. Apart from bilateral relations, ICT-based learning exposes teachers and students to work with people of different cultures.

Vl. Objectives

This 5-Day District Advance ICT Training Program for Teachers has the following objectives:

a. develop teachers' skills in Microsoft Word Application

b. develop teachers' skills in Spreadsheet and Microsoft Excel

c. develop teachers' skills in Making Powerpoint Presentation

d. develop teachers' skills in integrating powerpoint presentation/videos in the lesson

e. develop teachers' digital cameras knowledge

f. develop teachers' electronic presentation skills

g. and develop teachers' Worlwide Web Navigation Skills.

Vll. Participants

There will be 65 participants including the TWG, ICT Coordinators, teachers and speakers.

Vlll. Training Flow

ICT Technology Integration Seminar Workshop Training

Time	Day 1	Day 2	Day 3	Day 4	Day 5
8:01-9:00 AM	**Arrival and Registration**	**Management of Learning**	**Management of Learning**	**Management of Learning**	**Management of Learning**
9:00-10:00 AM	**Opening Program** National Anthem Prayer Welcome Remarks Message from the District Supervisor Rationale of Seminar Workshop	**Plenary Session 2** "Seminar-Workshop on the Use of Excel in Data Analysis" Objective/s: To develop teachers' skills in Spreadsheet and Microsoft Excel Speaker: Michelle Lopez	Presentation of Output in Plenary Session 3 (Seminar-Workshop on how to make and present Power point for students in Elementary Level)	Presentation of Output in Plenary Session 5 (Seminar-Workshop on Multimedia and Digital Arts for Teachers Part 1)	**Plenary Session 7** "Seminar-Workshop on Multimedia and Digital Arts for Teachers Part 3" Objective/s: To develop Worlwide Web Navigation Skills Speaker: Diana Rio
10:01-12:00 Noon	**Plenary Session 1** "Advance Orientation and Workshop in Microsoft Word Application Part 1" Objectives: To develop teachers' skills in Microsoft Word Application Speaker: Jerry Montes	Presentation of Output in Plenary Session 2 (Seminar-Workshop on the Use of excel in Data Analysis)	**Plenary Session 4** "Seminar-Workshop on Technology Integration in Teaching Elementary Students" Objective/s: To develop teachers' skills on integrating powerpoint presentation/ videos on the lesson Speaker: Reah Gomez	**Plenary Session 6** "Seminar-Workshop on Multimedia and Digital Arts for Teachers Part 2" Objective/s: To develop teachers' electronic presentation skills Speaker: Jerry Montes	Presentation of Output in Plenary Session 6 (Seminar-Workshop on Multimedia and Digital Arts for Teachers Part 3)
12:01-1:00 PM	**Lunch**				

1:01-2:00 PM	**Plenary Session 1** "Advance Orientation and Workshop in Microsoft Word Application Part 2" Objective/s: To develop teachers' skills in Microsoft Word Application Speaker: Jerry Montes	Presentation of Output in Plenary Session 2 (Seminar-Workshop on the Use of excel in Data Analysis)	Presentation of Output in Plenary Session 4 (Seminar-Workshop on Technology Integration in Teaching Elementary Students)	Presentation of Output in Plenary Session 6 (Seminar-Workshop on Multimedia and Digital Arts for Teachers Part 2)	**Closing Program** Awarding of Best Works Closing Remarks District ICT Coordinator Announcements Closing Prayer
2:01-5:00 PM	Presentation of Output in Plenary Session 1 (Advance Orientation and Workshop in Microsoft Word Application)	**Plenary Session 3** "Seminar-Workshop on how to make and present Powerpoint for students in Elementary Level" Objective/s: To develop Teachers' skills on Making Powerpoint Presentation Speaker Diana Rio	**Plenary Session 5** "Seminar-Workshop on Multimedia and Digital Arts for Teachers Part 1" Objective/s: To develop teachers' digital cameras knowledge Speaker Jerry Montes		

Personnel Involved

A. Technical Working Group (TWG)= 3 persons composed of District Supervisor and School Head.

B. Facilitators for the assigned topics which will be determined by the Chairman (District Supervisor) = 6 pax (maximum)

C. Venue: Zoom Conference/Google Meet (Virtual); Marilog District

(Hands-on)

Xl. Budgetary Requirements

Cost Estimates

Item Needed	Cost
Meals	P 15, 000.00
Training Materials	P 5, 000.00
Speaker's Allowance	P 6, 000.00
Equipments	P 10, 000.00
Other Administrative Expenses	P 10, 000.00
TOTAL	**P46,000.00**

XII. Monitoring and Evaluation

Respondent Type **Trainee:** ____ **Trainer:** ____ **Program Manager:** ___

Name (Optional) _____ **Sex:** _____

Program Title: _____ **Date:** _____

	After the conduct of the program, I believe that....		1	2	3	4
A. Program Planning, Management and Preparation	1	the training program was delivered as planned.				
	2	the training program was managed efficiently.				
	3	the training program was well-structured.				
B. Attainment of Objectives	4	the program objectives were clearly presented				
	5	the session objectives were logically arranged				
	6	the program and session objectives were attained				
C. Delivery of Program Content	7	program content was appropriate to trainees' roles and responsibilities				
	8	content delivered was based on authoritative and reliable sources				
	9	new learning was clearly presented				
	10	the session activities were effective in generating learning				
	11	adult learning methodologies were used effectively.				
	12	management of learning was effectively structured e.g. portfolio, synthesis of previous learning, etc.				
D. Trainees' Learning	13	trainees were encouraged to consider how ideas and skills gained during the				
		training could be incorporated into their own practices				
	14	contribution of all trainees, both male and female, were encouraged				
	15	trainees demonstrated a clear understanding of the content delivered				
E. Trainers' Conduct of Sessions	16	the trainers' competencies were evident in the conduct of the sessions.				
	17	teamwork among the trainers and staff was manifested.				
	18	trainers established a positive learning environment.				
	19	training activities moved quickly enough to maintain trainees' interest.				
F. Provision of support materials	20	training materials were clear and useful				
	21	powerpoint presentations supported the flow of the sessions				
	22	the resources provided were appropriate to trainees' needs				
G. Program Management Team	23	Program Management Team members were courteous				
	24	Program Management Team was efficient				
	25	Program Management Team was responsive to the needs of trainees				
H. Venue and Accommodation	26	the venue was well lighted and ventilated				
	27	the venue was comfortable with sufficient space for program activities				
	28	the venue had sanitary and hygienic conditions				
	29	meals were nutritious and sufficient in quantity and quality.				
	30	the accommodation was comfortable with sanitary and hygienic conditions				
I. Overall	31	I have the knowledge and skills to apply the new learning				
	32	I have the confidence to implement the JEL contract				

1. What do you consider your most significant learning from the program?
2. What changes would you suggest to improve similar programs in the future?
3. Briefly describe what you have learned and how it will help you with your work.
4. What further recommendations do you have?

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This section captures the findings of the study, the conclusions and the recommendations.

Summary of the Findings

The study employed descriptive correlation technique of research to gather data, ideas, facts and information on the technology integration knowledge and technology integration in different learning areas as perceived by the elementary teachers in rural schools. The researcher selected the 78 public elementary school teachers among the schools in one of the districts of Davao City Division as the respondents through stratified random sampling technique. The researcher made use of modified and enhanced adapted survey questionnaires.

The findings of the current study are the following:

1. Technology integration knowledge of the teachers was high on all the indicators except for content knowledge.
2. Among the learning areas, teachers always integrate technology in Science subject.
3. There is a significant relationship between technology integration knowledge of the teachers and technology integration in Science learning area.

Conclusions

Based on the findings of the study, the following conclusions are drawn:

1. Teachers apply the TPACK standards framework in all domains.
2. Teachers always integrate technology in science subject.

Recommendations

Based on the findings, the following recommendations are suggested for leaders and policy makers for consideration.

1. There is a need for teachers to attend trainings that address technology integration into pedagogical practices with a constructivist philosophy. These trainings will enable them to meet the 21st century needs of their students and best integrate technology in teaching and learning.
2. The district may adopt the ICT Training Program developed.
3. School administrators as well as stakeholders may upgrade the school's ICT- based resources for its optimum use in teaching and learning.
4. A similar study on a larger scale on ICT Integration in Teaching Learning be conducted.

REFERENCES

1. Abdi, S., Babapour, J., & Fathi, H. (2011). Relationship between cognitive emotion regulation styles and general health of students. Journal of Army University of Medical Sciences, 8, 45-53. Retrieved from http://ijn.iums.ac.ir/browse.php?a id=2394&sid=1&slclang=en
2. Abdi, S., Taban, S., & Ghaemian, A. (2012). Cognitive emotion regulation questionnaire: Validity and reliability of Persian translation of CERQ-36 item. Procardia-Social and Behavioral Sciences,

32, 2-7. Retrieved from https://core.ac.uk/download/pdf/82563710.pdf
3. Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies Across psychopathology: A meta-analytic review. Clinical Psychology Review, 30, 217-237. Retrieved from http://doi: 10.1016/j.cpr.2009.11.004
4. Aldwin, C. (2011). Culture, coping and resilience to stress. Retrieved from https://core.ac.uk/download/pdf/33416548.pdf
5. Archambault, K. (2015). Developing self-knowledge as a first step toward cultural competence. Manuscript in preparation. Retrieved from https://www.nacada.ksu.edu/Portals/0/NACADAreads/2016%20Guidebook/Archambault%20chapter%20NewAdvisorGuidebook.pdf.
6. Balzarotti, S., Biassoni, F., Villani, D., Prunas, A., & Velotti, P. (2014). Individual differences in cognitive emotion regulation: Implications for subjective and psychological well-Being. Journal of Happiness Studies, 1(1), 1-19. Retrieved from https://www.researchgate.net/publication/267173336
7. Bolanio, I., Baay, J., Baliguat, V., & Barbarona, M. A. (2018). Level of stress and coping mechanisms of teacher education interns of the University of Bohol. Retrieved from https://pdfs.semanticscholar.org/978d/83f9257e817f680e286e06b33713 65af3581.pdf
8. Barhem, B; Younies, H and Muhamad, R. (2009). Religiosity and work stress coping behavior of Muslim employees. Education, Business and Society: Contemporary Middle Eastern Issues, 2(2), 23-137.
9. Beers, J.C. (2012). Teacher stress and coping: Does the Process Differ according to years of teaching experience? Retrieved from https://core.ac.uk/download/pdf/37772292.pdf
10. Carver, C.S. (2013). Cope Inventory. Retrieved from http://www.midss.org/sites/default/files/cope.pdf
11. Coleman, S. & Stevenson, H. (2013). The racial stress of membership: development of the faculty Inventory of racialized experiences in schools. Psychology in the Schools, 50(6), 548-566. Retrieved from http://doi: 10.1002/pits.21693
12. Cox, S. J., Mezulis, A. H., & Hyde, J. S. (2010). The influence of child gender role and maternal feedback to child stress on the emergence of the gender difference in depressive rumination in adolescence. Developmental Psychology, 46, 842-852. Retrieved from http://doi:10.1037/a0019813
13. Dan-Glauser, E. S., & Gross, J. J. (2013). Emotion regulation and emotion coherence: evidence for strategy-specific effects. Emotion, 13(5), 832. Retrieved from http://doi: 10.1037/a0032672
14. Dan-Glauser, E. S., & Gross, J. J. (2015). The temporal dynamics of emotional acceptance: Experience, expression, and physiology. Biological Psychology, 108, 1-12. http://dx.doi.org/10.1016/j.biopsycho.2015.03.005
15. Dicke, T., Elling, J., Schmeck, A., & Leutner, D. (2015). Reducing reality shock: The effects of classroom management skills training on beginning teachers. Teaching & Teacher Education, 481-12. http://doi:10.1016/j.tate.2015.01.013
16. Dora, A. G. (2012). The contribution of self-control, emotion regulation, rumination, and gender to test anxiety of university students. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.474.2125&rep= rep1&type=pdf
17. Eisner, L. R., Johnson, S. L., & Carver, C. S. (2009). Positive affect regulation in anxiety disorders. Journal of Anxiety Disorder, 23, 645-649. https://www.ncbi.nlm.nih.gov/pubmed/19278820
18. Ferguson, K., Mang, C., & Frost, L. (2017). Teacher stress and social support usage. Brock Education Journal, 26(2), 62-86. https://files.eric.ed.gov/fulltext/EJ1160705.pdf
19. Freire, C., Ferrada M., & Valle, A. (2016). Profiles of psychological well-being and coping strategies among university students. Frontiers in Psychology, 7, 21-29. https://www-lib-uwo-ca.proxy1.lib.uwo.ca/cgibin/ezpauthn.cgi?url=http://search.proquest.com.proxy1.lib.uwo.ca/docview/1857840004?accountid= 15115
20. Gardner, S. (2010). Stress among prospective teachers: A review of the literature. Australian Journal of Teacher Education, 35(8), 1-9. http://doi:10.14221/ajte.2010v35n8.2
21. Garnefski, N., & Kraaij, V. (2007). The cognitive emotion regulation questionnaire: Psychometric features and prospective relationships with depression and anxiety in adults. Retrieved from https://pdfs.semanticscholar.org/5749/a431d3091e3b73c70421f6bc9586 98872dae.pdf

22. Gay, G. (2010). Culturally responsive teaching: Theory, research, and practice (3rd ed.). New York, NY: Teachers College Press.
23. Gies, E. A. (2010). A case study of cultural competency: The transformation of individuals and collective perception and practice (Doctoral dissertation).Retrieved from ProQuest Dissertations and Theses. (828353768)
24. Gillespie, V. (2019). Unheard voices: Student perceptions about cultural competence in the independent school classroom.
25. Godwin-Jones, R. (2013). Integrating intercultural competence into language learning through technology. Language Learning & Technology, 17(2), 1–11. Retrieved from https://www.lltjournal.org/item/2804
26. Goodman, D. J. (2013). Cultural competence for social justice. Retrieved from http://dianegoodman.com/documents/TheCulturalCompetenceforSocialJ usticeModel-2pages.pdf
27. Gordon, A. (2017). Teachers' union raises alarm over rising violence in schools: ETFO calls for more supports for kids with behavioural issues. The Toronto Star. https://www.thestar.com/yourtoronto/education/2017/01/17/teachers-union-raisesalarm-over-rising-violence-in-schools.html
28. Greater Vancouver Island Multicultural Society (2009). Cultural competence self-assessment checklist. Retrieved from http://rapworkers.com/wp-content/uploads/2017/08/cultural-competence-selfassessment-checklist-1.pdf
29. Hammer, M. (2012). The intercultural development inventory: A new frontier in assessment and development of intercultural competence. Retrieved from https://idiinventory.com/wp-content/uploads/2017/01/HAMMER-IDI-STUDY-ABROAD-ARTICLE-2012.pdf
30. Hammond, Z. (2015). Culturally responsive teaching and the brain: Promoting authentic engagement and rigor among culturally and linguistically diverse students. Thousand Oaks, CA: Corwin, a SAGE Company.
31. Harding, B. (2010). Relational skills: Establishing cultural credibility. In P. Folsom (Ed.), The new advisor guidebook: Mastering the art of advising through the first year and beyond. Manhattan, KS: National Academic Advising Association.
32. Harrington, R., & Loffredo, D. A. (2010). Insight, rumination, and self-reflection as predictors of well-being. The Journal of Psychology, 145(1), 39-57. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/21290929
33. Harris, G. (2011). Individual stress management coursework in Canadian teacher preparation programs. Canadian Journal of Education, 34(4), 104-117. Retrieved from http://ojs.vre.upei.ca/index.php/cje-rce/article/view/723/1104
34. Izmaylova, A. (2017). Using social media to develop intercultural competence through telecollaboration. Retrieved from https://ir.uiowa.edu/cgi/viewcontent.cgi?article=6994&context=etd
35. Jackson, C., Simoncini, K., & Davidson, M. (2013). Classroom profiling training: Increasing preservice teachers' confidence and knowledge of classroom management skills. Australian Journal of Teacher Education, 38(8), 1-21. Retrieved from http://doi: 10.14221/ajte.2013v38n8.2
36. Jin, S. (2013). The use of facebook to promote Korean EFL learners' intercultural competence. Available from ProQuest Dissertations & Theses Global. (1724678935). Retrieved from http://proxy.lib.uiowa.edu/login?url=http://search.proquest.com.proxy.lib.uiowa.edu/docview/1724678935?accountid=14663
37. Kaspereen, D. (2012). Relaxation intervention for stress reduction among teachers and staff. International Journal of Stress Management, 19(3), 238-250. Retrieved from https://psycnet.apa.org/record/2012-17912-001
38. Keengwe, J. (2010). Fostering cross-cultural competence in preservice teachers through multicultural education experiences. Early Childhood Education Journal, 28(1), 197 – 204. Retrieved from https://link.springer.com/chapter/10.1007/978-94-6351-215-2 17
39. Keng, S. L., Smoski, M. J., & Robins, C. J. (2016). Effects of mindful acceptance and reappraisal training on maladaptive beliefs about rumination. Mindfulness, 1- 11. Retrieved from http://doi 10.1007/s12671-

015-0480-x
40. Klassen, R., & Chui, M. (2010). Effects on teachers' self-efficacy and job satisfaction: Teacher gender, years of experience, and job stress. Journal of Educational Psychology, 102(3), 741-756. Retrieved from http://doi:10.1037/a0019237
41. Klassen, R., Usher, E., & Bong, M. (2010). Teachers' collective efficacy, job satisfaction, and job stress in cross-cultural context. Journal of Experimental Education, 78(4), 464-486. Retrieved from http://doi:10.1080/00220970903292975
42. Kohli, H. (2010). Historical and theoretical development of culturally competent social work practice. Journal of Teaching in Social Work, 30(3), 252-271. Retrieved from fhttp://doi:10.1080/08841233.2010.499091.pdf
43. Kohl, A., Rief, W., & Glombiewski, J. A. (2012). How effective are acceptance strategies? A meta-analytic review of experimental results. Journal of Behavior Therapy and Experimental Psychiatry, 43, 988-1001. Retrieved from http://doi: 10.1016/j.jbtep.2012.03.004
44. Kumar, R., Zusho, A., & Bondie, R. (2018). Weaving cultural relevance and achievement motivation into inclusive classroom cultures. Educational Psychologist, 53(2), 78-96. Retrieved from https://www.tandfonline.com /doi/abs/10.1080/00461520.2018.1432361?journalCode=hedp20
45. Kuo, B. C.H. (2011). Culture' s consequences on coping: Theories, evidence, and dimensionalities. Retrieved from https://core.ac.uk/download/pdf/72765673.pdf
46. Lannem, A. M. (2011). The role of physical exercise as a stress-coping resource for persons with functionally incomplete spinal cord injury. Doctoral dissertation, Norwegian School of Sport Sciences. Retrieved from https://nih.brage.unit.no/nih-xmlui/handle/11250/171328
47. Leavitt, R. (2010). Cultural competence: A lifelong journey to cultural profience. Retrieved from https://www.worldcat.org/title/cultural-competence-a-lifelong-journey-to-cultural-proficiency/oclc/880453183
48. Lindsey, R. B., Robins, K. N., & Terrell, R. D. (2010). Cultural proficiency: A manual for school leaders (2nd ed.). Thousand Oaks, CA: Corwin Press. Retrieved from https://cmc.marmot.org/Record/.b26602805
49. Marks, A. N. (2011). Cultural competence: What teachers know and perceive (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (863675186)
50. Michalak, L, Trocki, K., & Bond, J. (2007). Religion and alcohol in the U.S. National Alcohol Survey. Drug & Alcohol Dependence, 87, 268-280.
51. Michl, L. C., McLaughlin, K. A., Shepherd, K., & Nolen-Hoeksema, S. (2013). Rumination as a mechanism linking stressful life events to symptoms of depression and anxiety: Longitudinal evidence in early adolescents and adults. Journal of Abnormal Psychology, 122(2), 339–352. Retrieved from http//:doi:10.1037/a0031994
52. Moses, A. E. (2016). Stress management and teachers' productivity in Cameroon: Lessons from Momo Division. Journal of Education and Practice, 7(33), 72-82. Retrieved from https://pdfs.semanticscholar.org/60e8/87da8d9a1d1f785d2bcd0995f80c 26a0b43a.pdf
53. Moule, J. (2012). Cultural competence: A primer for educators (2nd ed.). Belmont, CA: Wadsworth. Retrieved from https://www.amazon.com/Cultural-Competence-Primer-Educators-Education/dp/0495915297
54. Ng, S. K. (2016). Teachers' experiences of occupational stress in public primary schools. Retrieved from https://www.researchgate.net/publication/331768074 TEACHERS' EXP ERIENCES OF OCCUPATIONAL STRESS IN PUBLIC PRIMARYS CHOOLS
55. OpenCon. (2017). Diversity, equity, and inclusion. Retrieved from https://sparcopen.org/wp-content/uploads/2017/07/Diversity-Equity-and-Inclusion-Report-July-10-V1-Release.pdf
56. Osagie, I., & Iyore, C. (2018). The stressors, effects and coping strategies among teachers in secondary schools in Edo State, Nigeria. International Journal of Research Haalayah, 1(2), 1-2. Retrieved from http://oaji.net/articles/2017/1330-1538817925.pdf
57. Osman-Gani, A., Hashim, J., & Ismail, Y. (2010). Effects of religiosity, spirituality, and personal values on

employee performance: A conceptual analysis. Retrieved from http://irep.iium.edu.my/2787/1/Shanghai2010-Religiousity%26Spirituality-AAhad%26Jun-1.doc – EDITED to 6000 words.pdf

58. Partelow, L., Spong, A., Brown, C., & Johnson, S. (2017). American needs more teachers of color and a more selective teaching profession. Retrieved fromhttps://www.americanprogress.org/issues/education-k-
59. 12/reports/2017/09/14/437667/america-needs-teachers-color-selective-teaching-profession/
60. Pierre, C. (2013). The interactive effects of coping strategies, gender, and stress in the prediction of internalizing symptoms in African American Youth: An application of the specificity model. Retrieved from https://pdfs.semanticscholar.org/fd1c/db31ea5c34bac7179cc69ca9ba10 14d8b8d8.pdf
61. Reiche, S. (2012). Want to become more culturally competent? Start with your cultural self-awareness. Retrieved from https://blog.iese.edu/expatriatus/2012/12/05/want-tobecome-more-culturally-competent-start-with-your-cultural-self-awareness/
62. Robinson, E. N. (2012). The relationship between teacher cultural competency and student engagement. Retrieved from https://digitalcommons.du.edu/cgi/ viewcontent.cgi?referer=&httpsredir=1&article=1552&context=etd
63. Ryan, K. (2013). How problem focused and emotion focused coping affects college students' perceived stress and life satisfaction. Retrieved from https://pdfs.semanticscholar.org/a2da/542c75c6b1d6b48f9d8320db7948 4896b22d.pdf
64. Salend, S. J. (2010). Creating inclusive classrooms: Effective, differentiated, and reflective practices (6th ed.). City, ST: Publisher.
65. Sammons, A. (2011). Culture and stress. Retrieved from http://www.psychlotron.org.uk/resources/physiological/aqa as stress cu lturearticle.pdf
66. Sandell, E., & Tupy, S. (2015). Where cultural competency begins: Changes in undergraduate students' intercultural competency. International Journal of Teaching and Learning in Higher Education, 27(3), 364-381. Retrieved from https://files.eric.ed.gov/fulltext/EJ1093756.pdf
67. Spence, O. (2016). Teachers' cultural competence and students' perception of the social classroom climate in culturally different middle school classrooms. Retrieved from https://digitalcommons.andrews.edu/cgi/viewcontent.cgi?article=2871&c ontext=dissertations
68. Stith-Williams, V., & Haynes, P. L.M. (2010). For cultural competence: Knowledge, skills and dispositions needed to embrace diversity. Virginia Department of Education. Retrieved from http://www.doe.virginia.gov/specialed/techasst profdev/self assessm ent/disproportionality/cultural competence manual.pdf
69. Templeton, N. (2011). Understanding social justice: Improving the academic achievement of African American students. International Journal of Educational Leadership Preparation, 6(2), 39-47. Retrieved from https://eric.ed.gov/?id=EJ973833
70. Troy, A. S., Shallcross, A. J., Davis, T., & Mauss, I. B. (2013). History of mindfulnessbased cognitive therapy is associated with increased cognitive reappraisal ability. Mindfulness, 4, 213-222. Retrieved from http://doi:10.1007/s12671-012-0114-5
71. Wolgast, M., Lundh, L. G., & Viborg, G. (2011). Cognitive reappraisal and acceptance: An experimental comparison of two emotion regulation strategies. Behaviour Research and Therapy, 49, 858-866. http://doi:10.1016/j.brat.2011.09.011
72. Yarcheski, A., Mahon, N. E., & Yarcheski, T. J. (2010). Social Support and Well-Being in Early Adolescents: The Role of Mediating Variables. Clinical Nursing Research. doi:10.1177/10547730122158851
73. Zlomke, K. R., & Hahn, K. S. (2010). Cognitive emotion regulation strategies: Gender differences and associations to worry. Personality and Individual Differences, 48, 408-411. Retrieved from http://doi: 10.1016/j.paid.2009.11.007

APPENDICES

Appendix A

TRAINING DESIGN

I. Rationale

Based on the findings of this research study on technology integration knowledge and integration on different learning areas, there is a need for the teachers to be properly equipped with ICT skills that are essential on their delivery of the subject matter. Information and Communications Technology (ICT) can impact student learning when teachers are digitally literate and understand how to integrate it into curriculum. Thus, there is a need for schools to use a diverse set of ICT tools to communicate, create, disseminate, store, and manage information. Apart from bilateral relations, ICT-based learning provides opportunities for teachers as well as students to work with people of different cultures

Objectives

This 5-Day District Advance ICT Training Program for Teachers aims to:

a. develop teachers' skills in Microsoft Word Application;
b. develop teachers' skills in Spreadsheet and Microsoft Excel; c. develop teachers' skills in Making Powerpoint Presentation;
d. develop teachers' skills in integrating powerpoint presentation/videos in the lesson
e. develop teachers' knowledge in digital cameras f. develop teachers' electronic presentation skills
g. develop teachers' Worlwide Web Navigation Skills.

II. Methodology:

1. Virtual Capacity Building and/or Hands-on workshop (per batch) in accordance with the IATF guidelines on COVID-19 pandemic.

Personnel Involved

a. Number of Pax as Technical Working Group (TWG)= 3 persons composed of District Supervisor and School Head.
b. Facilitators for the assigned topics which will be determined by the Chairman (District Supervisor) = 6 pax (maximum)
c. Venue: Zoom Conference/Google Meet (Virtual); Marilog District (Hands-on)

III. Budgetary Requirements

Date	Expected Participants	Estimated Budget
Tentative	All Teachers	Php 3 000.000
Tentative	All Teachers	Php 3 000.000
Tentative	All Teachers	Php 3 0000.000
Tentative	All Teachers	Php 3 000.000
Tentative	All Teachers	Php 3 000.000

IV. PARTICIPANTS

65 participants including TWG, ICT Coordinators, Teachers, and speakers.

ICT Technology Integration Seminar Workshop Training

Time	Day 1	Day 2	Day 3	Day 4	Day 5
8:01-9:00 AM	Arrival and Registration	Management of Learning	Management of Learning	Management of Learning	Management of Learning
9:00-10:00 AM	Opening Program National Anthem Prayer Welcome Remarks Message from the District Supervisor Rationale of Seminar Workshop	Plenary Session 2 " Seminar-Workshop on the Use of Excel in Data Analysis " Objective/s: To develop teachers' skills in Spreadsheet and Microsoft Exce Speaker: Michelle Lopez	Presentation of Output in Plenary Session 3 (Seminar-Workshop on how to make and present Power point for students in Elementary Level)	Presentation of Output in Plenary Session 5 (Seminar-Workshop on Multimedia and Digital Arts for Teachers Part 1	Plenary Session 7 " Seminar-Workshop on Multimedia and Digital Arts for Teachers Part 3" Objective/s To develop Worldwide Web Navigation Skills Speaker: Diana Ric
10:01-12:00 Noon	Plenary Session 1 " Orientation and Workshop in Microsoft Word Application Part 1" Objectives: To develop teachers' skills in Microsoft Word Application Speaker: Jerry Montes	Presentation of Output in Plenary Session 2 (Seminar-Workshop on the Use of excel in Data Analysis)	Plenary Session 4 " Seminar-Workshop on Technology Integration in Teaching Elementary Students " Objective/s: To develop teachers' skills integrating powerpoint presentation/ videos on the lesson Speaker: Reah Gomez	Plenary Session 6 " Seminar-Workshop on Multimedia and Digital Arts for Teachers Part 2" Objective/s To develop electronic teachers presentation skills Speaker: Jerry Montes	Presentation of Output in Plenary Session 6 (Seminar-Workshop on Multimedia and Digital Arts for Teachers Part 3)

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Time	Day 1	Day 2	Day 3	Day 4	Day 5
8:01-9:00 AM	Arrival and Registration	Management of Learning	Management of Learning	Management of Learning	Management of Learning
12:01-1:00 PM	Lunch				
1:01-2:00 PM	**Plenary Session 1** " Orientation and Workshop in Microsoft Word Application Part 2" Objective/s: To develop teachers' skills in Microsoft Word Application	Presentation of Output in Plenary Session 2 (Seminar-Workshop on the Use of excel in Data Analysis)	Presentation of Output in Plenary Session 4 (Seminar-Workshop on Technology Integration in Teaching Elementary Students)	Presentation of Output in Plenary Session 6 (Seminar-Workshop on Multimedia and Digital Arts for Teachers Part 2	**Closing Program** Awarding of Best Works Closing Remarks District ICT Coordinator Announcements Closing Prayer
2:01-5:00 PM	Presentation of Output in Plenary Session 1 (Advance Orientation and Workshop in Microsoft Word Application)	**Plenary Session 3** " Seminar-Workshop how to make and present Powerpoint for students in Elementary Level" Objective/s: To develop teachers' skills on Making Powerpoint Presentation Speaker Diana Rio	**Plenary Session 5** " Seminar-Workshop Multimedia and Digital Arts for Teachers Part 1" Objective/s: To develop digital teachers' knowledge Speaker Jerry Montes		

Appendix B

SURVEY QUESTIONNAIRE

Questionnaires to Measure the Level of Technology Integration Knowledge of Teachers (TPCK)

Adapted from Zahra and Anand Kamal

Name:_____

School: _____

Select one level of agreement for each statement to indicate your response. Place an "X" in the appropriate cell box.
SD = Strongly Disagree, D = Disagree, U = Undecided, A =Agree, SA = Strongly Agree

Item for measuring Technology Knowledge
1. I know how to solve my own technical problems. I can learn technology easily
2. I can learn technology easily
3. I frequently play around the technology
4. I know about a lot of different technologies
5. I have the technical skills I need to use technology
6. I have had sufficient opportunities to work with different technologies
7. I can use technology tools to process data and report results
8. I can use technology in the development of strategies for solving problems in the real world
9. I have ability to design webpages and to use authoring software
10. I understand the legal, ethical, cultural, and societal issues related to technology

Item for measuring Pedagogy Knowledge
1. I know how to assess student performance in a classroom.
2. I can adapt my teaching based upon what students currently understand or do not understand.
3. I can use a wide range of teaching approaches in a classroom setting (collaborative learning, direct instruction, inquiry learning, problem/project based learning etc.
4. I am familiar with common student understandings and misconceptions.
5. I know how to organize and maintain classroom management.
6. I can assess student learning in multiple ways.
7. I can adapt my teaching style to different learners.

Item for measuring Content Knowledge
1. I have sufficient knowledge about (the particular content)
2. I can use the particular subject as the way of thinking.
3. I have various ways and strategies of developing my understanding of the particular content
4. I have sufficient knowledge about the structure of knowledge of the particular content.
5. I know concept, facts, theories and procedure within the particular content.
6. I believe in the validity and reliability of the particular content.

Item for measuring Technological Content Knowledge
1. I know about technologies that I can use for understanding the particular content.
2. I know how to use of specific software and Web sites about (the particular content)
3. I can find and evaluate the resources that I need for the particular content.
4. I can use technology for presenting the particular content.
5. I can use technology tools and resources for managing and communicating information of the particular content.

Item for measuring Pedagogical Content Knowledge
1. I know how to select effective teaching approaches to guide student thinking and learning in the particular content.
2. I know the purposes and objectives for the particular content.
3. I am able to manage of my students' learning about the particular content.
4. I have the curricular knowledge (horizontal and vertical) of the particular content.
5. I know instructional strategies that are suitable for the topic.
6. I know prior knowledge of students about the particular content.
7. I know how and what to assess of the particular content.

Item for measuring Technological Pedagogical Knowledge
1. I can choose technologies that enhance the teaching approaches for a lesson.
2. I can choose technologies that enhance students' learning for a lesson.
3. I am thinking critically about how to use technology in my classroom.
4. I can adapt the use of the technologies that I am learning about to different teaching activities.

5. My teacher education program has caused me to think more deeply about how technology could influence the teaching approaches I use in my classroom.
6. I can use technology resources to facilitate higher order thinking skills, including problem solving, critical thinking, decision - making, knowledge and creative thinking.
7. I can infuse technology to strategies of teaching.
8. I can use technology for more collaboration and communication among students and with teachers, too.
9. I know how to use technology to facilitate academic learning.
Item for measuring Technological Pedagogical Content Knowledge
1. I can teach lessons that appropriately combine the particular content, technologies and teaching approaches.
2. I can select technologies to use in my classroom that enhance what I teach, how I teach and what students learn.
3. I can use strategies that combine the particular content, technologies and teaching approaches that I learned about in my coursework in my classroom.
4. I can provide leadership in helping others to coordinate the use of the particular content, technologies and teaching approaches at my school and/or district.
5. I can choose technologies that enhance the learning of the particular content for a lesson.
6. I can evaluate and select new information resources and technological innovations based on their appropriateness to specific tasks in the particular content.
7. I can use the particular content, specific tools (e.g., software, simulations, environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research.

Instructions: Please tick ONLY the subjects you handle. However, if you teach all the eight (8) subjects below, you should tick all the subjects.

How often do you integrate technology in your subjects?	Never (1)	Seldom (2)	Often (3)	Always (4)
a. ENGLISH				
☞ Present lessons using LCD Projector or gadgets.				
☞ Teach student-centered activities in which students apply technology tools and resources.				
b. MATH				
☞ Use calculators to solve Math problems.				
☞ Teach student-centered activities in which students apply technology tools and resources.				
c. SCIENCE				
☞ Manipulate laboratory equipment to aid learning.				
☞ Teach student-centered activities in which students apply technology tools and resources.				
d. FILIPINO				
☞ Present lessons using LCD Projector or gadgets.				
☞ Teach student-centered activities in which students apply technology tools and resources.				
e. ARALING PANLIPUNAN				
☞ Present lessons using LCD Projector.				
☞ Teach student-centered activities in which students apply technology tools and resources.				
f. EsP				
☞ Organizers are used to present ideas.				
☞ Teach student-centered activities in which students apply technology tools and resources.				
g. EPP				
☞ Use of videos/cameras to record actual performance of students.				
☞ Teach student-centered activities in which students apply technology tools and resources.				
h. MAPEH				
☞ Connect statistical skills, and its 4 main components (Music, Arts, Physical Education, and Health) related to our lives.				
☞ Teach student-centered activities in which students apply technology tools and resources.				

Researcher: Jessie G. Saloma

Appendix C

PILOT TEST RESULT

Case Processing Summary

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

Reliability Statistics

Cronbach's Alpha	N of Items
0.970	52

Item Statistics

	Mean	Std. Deviation	N
Item1	3.5667	1.04000	30
Item2	3.4333	.89763	30
Item3	3.3667	1.27261	30
Item4	3.4667	1.04166	30
Item5	3.7000	.87691	30
Item6	3.2000	.80516	30
Item7	3.7333	.90719	30
Item8	3.7000	.87691	30
Item9	3.6667	.92227	30
Item10	3.5667	.77385	30
Item11	3.6333	.80872	30
Item12	3.3667	1.18855	30
Item13	3.7000	.87691	30
Item14	3.6667	.92227	30
Item15	3.1000	1.06188	30
Item16	3.6667	1.02833	30
Item17	3.4333	.93526	30
Item18	3.5667	1.22287	30
Item19	3.9667	.99943	30
Item20	3.3000	.87691	30
Item21	4.0333	.96431	30
Item22	3.8667	.50742	30
Item23	3.7333	.69149	30
Item24	3.7667	.72793	30
Item25	4.1333	.77608	30
Item26	3.4667	1.07425	30
Item27	3.6333	.99943	30
Item28	4.0667	.90719	30
Item29	3.5667	.62606	30
Item30	3.0000	1.05045	30
Item31	3.3000	1.14921	30
Item32	3.4333	.77385	30
Item33	3.7000	.87691	30
Item34	3.3667	.80872	30
Item35	3.2000	.80516	30
Item36	3.6333	.80872	30
Item37	3.3667	1.18855	30
Item38	3.7000	.87691	30
Item39	3.6667	.92227	30
Item40	3.1000	1.06188	30
Item41	3.6667	1.02833	30
Item42	3.4333	.93526	30
Item43	3.5667	1.22287	30
Item44	3.9667	.99943	30
Item45	3.3000	.87691	30
Item46	4.0333	.96431	30
Item47	3.8667	.50742	30
Item48	3.7333	.69149	30
Item49	3.7667	.72793	30
Item50	4.1333	.77608	30
Item51	3.8667	.50742	30
Item52	3.7333	.69149	30

Appendix D

Letter Request for Validation of the Survey Questionnaire

September 21, 2020

JULIETA M. VILLAROSA Master Teacher I

Ramon F. Magsaysay Elementary School Daliaon District

Davao City

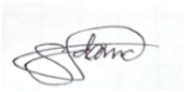
Madam:

My thesis entitled, **"LEVEL OF TECHNOLOGY INTEGRATION KNOWLEDGE OF TEACHERS IN RURAL ELEMENTARY SCHOOL: AN ANALYSIS OF TPACK FRAMEWORK"** needs a questionnaire validation.

Knowing fully of your expertise along this line, I am requesting your end for the possible enhancement of the characteristics of my questionnaire.

Your effort in sharing your forte is very much appreciated**.**

Respectfully yours,



JOSE JESSIE G. SALOMA Researcher

Noted**:**

DR. LINDY C. LULAB

Adviser

September 21, 2020

DAFFODIL P. TENERIFE Master Teacher II

Ramon F. Magsaysay Elementary School Daliaon District

Davao City

Madam:

My thesis entitled, **"LEVEL OF TECHNOLOGY INTEGRATION KNOWLEDGE OF TEACHERS IN RURAL ELEMENTARY SCHOOL: AN ANALYSIS OF TPACK FRAMEWORK "** needs a questionnaire validation.

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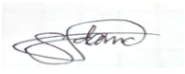

JOSE JESSIE G. SALOMA Researcher

Noted**:**

DR. LINDY C. LULAB

Adviser

September 21, 2020

AUBREY S. YAP Teacher III

South District Davao Occidental

Madam:

My thesis entitled, **"LEVEL OF TECHNOLOGY INTEGRATION KNOWLEDGE OF TEACHERS IN RURAL ELEMENTARY SCHOOL: AN ANALYSIS OF TPACK FRAMEWORK"** needs a questionnaire validation.

Knowing fully of your expertise along this line, I am requesting your end for the possible enhancement of the characteristics of my questionnaire.

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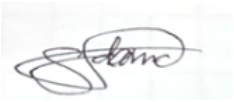


JOSE JESSIE G. SALOMA Researcher

Noted**:**

DR. LINDY C. LULAB

Adviser

Appendix E

VALIDATION SHEET

Name of Validator	**DAFFODIL P. TENERIFE**
Highest Degree	Doctor of Education
: Position	Master Teacher II
To the evaluator : Please check the appropriate number of your ratings	

	5	4	3	2	1
1. Clarity of Language The vocabulary level, language structure and conceptual level of the questions suit the level of respondents. The items are written in clear and understandable manner.	√				
2. Presentation/Organization of Topic The items are presented and organized in a logical manner	√				
3. Suitability of Items the items appropriately presented to substance of the research. The questions are designed to determine the condition, knowledge, perception and attitude that are supposed to be measured.	√				
4. Adequacy of Purpose The items appropriately presented to substance of the research adequately. The number of question per area is representative enough of all the questions needed for research.	√				
5. Attainment of Purpose The instrument as a whole fulfills the objectives for which it was constructed.	√				
6. Respondent-Friendliness Does the questionnaire create a positive impression, one that motivates respondents to answer it?	√				
7. Objectivity No aspect of the questionnaire suggest bias on the part of the research.	√				

Comments/Suggestions/Recommendations:

DAFFODIL P. TENERIFE

Print Name & Signature of Validator

Name of Validator	**AUBREY S. YAP**
Highest Degree :	Master in Education
Position :	Teacher III
To the evaluator : Please check the appropriate number of your ratings	

	5	4	3	2	1
1. Clarity of Language The vocabulary level, language structure and conceptual level of the questions suit the level of respondents. The items are written in clear and understandable manner.	√				
2. Presentation/Organization of Topic The items are presented and organized in a logical manner	√				
3. Suitability of Items the items appropriately presented to substance of the research. The questions are designed to determine the condition, knowledge, perception and attitude that are supposed to be measured.	√				
4. Adequacy of Purpose The items appropriately presented to substance of the research adequately. The number of question per area is representative enough of all the questions needed for research.	√				
5. Attainment of Purpose The instrument as a whole fulfills the objectives for which it was constructed.		√			
6. Respondent-Friendliness Does the questionnaire create a positive impression, one that motivates respondents to answer it?	√				
7. Objectivity No aspect of the questionnaire suggest bias on the part of the research.	√				

Comments/Suggestions/Recommendations:

AUBREY S. YAP

Print Name & Signature of Validator

Name of Validator	**JULIETA M. VILLAROSA**
Highest Degree :	Master in Education
Position	Master Teacher I
To the evaluator : Please check the appropriate number of your ratings	

	5	4	3	2	1
8. Clarity of Language The vocabulary level, language structure and conceptual level of the questions suit the level of respondents. The items are written in clear and understandable manner.	√				
9. Presentation/Organization of Topic The items are presented and organized in a logical manner	√				
10. Suitability of Items the items appropriately presented to substance of the research. The questions are designed to determine the condition, knowledge, perception and attitude that are supposed to be measured.	√				
11. Adequacy of Purpose The items appropriately presented to substance of the research adequately. The number of question per area is representative enough of all the questions needed for research.	√				
12. Attainment of Purpose The instrument as a whole fulfills the objectives for which it was constructed.	√				
13. Respondent-Friendliness Does the questionnaire create a positive impression, one that motivates respondents to answer it?	√				
14. Objectivity No aspect of the questionnaire suggest bias on the part of the research.	√				

Comments/Suggestions/Recommendations:

JULIETA M. VILLAROSA

Print Name & Signature of Validator

Appendix F

Certification of Experts as To Content and Construct Validity of the Survey Instrument

October 12, 2020

The Panelists

University of Southeastern Philippines Graduate School

Bo. Obrero St, Davao City

Dear Sir/ Madam:

This is to certify that the attached survey instrument in **"LEVEL OF TECHNOLOGY INTEGRATION KNOWLEDGE OF TEACHERS IN RURAL ELEMENTARY SCHOOLS: AN ANALYSIS OF TPACK FRAMEWORK"** study of JOSE JESSIE G. SALOMA is a comprehensive and valid instrument for measuring the essence, substance, and purpose of the study.

The undersigned therefore certifies the content and construct validity of the said instrument.

DAFFODIL P. TENERIFE Master Teacher II

Ramon F. Magsaysay Elementary School Daliaon District

Davao City

Certification of Experts as To Content and Construct Validity of the Survey Instrument

January 10, 2021

The Panelists

University of Southeastern Philippines Graduate School

Bo. Obrero St, Davao City

Dear Sir/ Madam:

This is to certify that the attached survey instrument in **"LEVEL OF TECHNOLOGY INTEGRATION KNOWLEDGE OF TEACHERS IN RURAL ELEMENTARY SCHOOLS: AN ANALYSIS OF TPACK FRAMEWORK"** study of JOSE JESSIE G. SALOMA is a comprehensive and valid instrument for measuring the essence, substance, and purpose of the study.

The undersigned therefore certifies the content and construct validity of the said instrument.

AUBREY S. YAP Teacher III

South District Davao Occidental

Certification of Experts as To Content and Construct Validity of the Survey Instrument

January 3, 2021

The Panelists

University of Southeastern Philippines Graduate School

Bo. Obrero St, Davao City

Dear Sir/ Madam:

This is to certify that the attached survey instrument in **"LEVEL OF TECHNOLOGY INTEGRATION KNOWLEDGE OF TEACHERS IN RURAL ELEMENTARY SCHOOLS: AN ANALYSIS OF TPACK FRAMEWORK"** study of JOSE JESSIE G. SALOMA is a comprehensive and valid instrument for measuring the essence, substance, and purpose of the study.

The undersigned therefore certifies the content and construct validity of the said instrument.

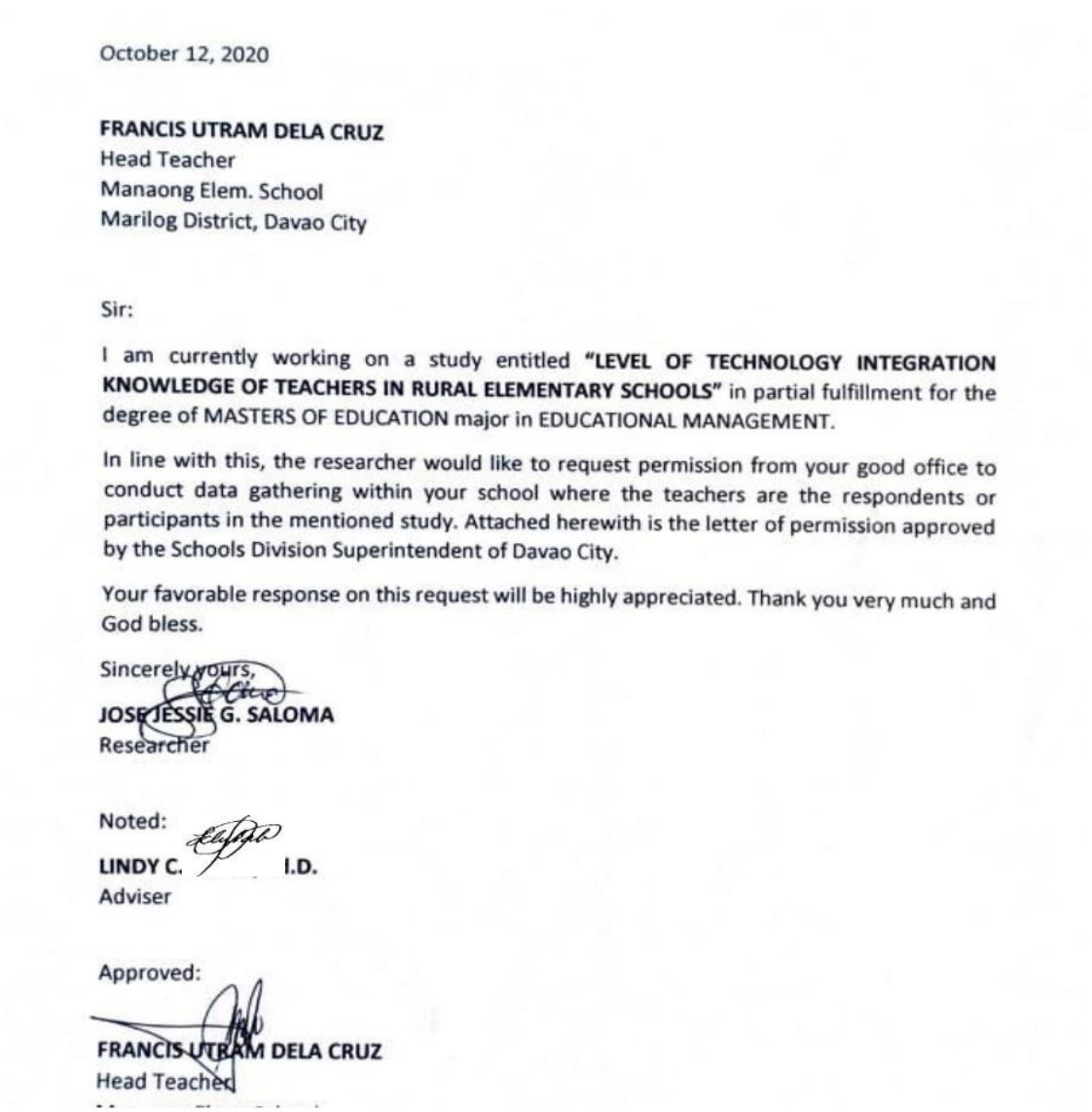
JULIETA M. VILLAROSA Master Teacher I

Ramon F. Magsaysay Elementary School Daliaon District

Davao City

Appendix G

Letter of Request to Conduct Study



October 12, 2020

FRANCIS UTRAM DELA CRUZ
Head Teacher
Manaong Elem. School
Marilog District, Davao City

Sir:

I am currently working on a study entitled **"LEVEL OF TECHNOLOGY INTEGRATION KNOWLEDGE OF TEACHERS IN RURAL ELEMENTARY SCHOOLS"** in partial fulfillment for the degree of MASTERS OF EDUCATION major in EDUCATIONAL MANAGEMENT.

In line with this, the researcher would like to request permission from your good office to conduct data gathering within your school where the teachers are the respondents or participants in the mentioned study. Attached herewith is the letter of permission approved by the Schools Division Superintendent of Davao City.

Your favorable response on this request will be highly appreciated. Thank you very much and God bless.

Sincerely yours,

JOSE JESSIE G. SALOMA
Researcher

Noted:

LINDY C. I.D.
Adviser

Approved:

FRANCIS UTRAM DELA CRUZ
Head Teacher

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume IX Issue XI November 2025

October 12, 2020

HANZEL C. SALVA
Head Teacher
Balah Elem. School
Marilog District, Davao City

Sir:

I am currently working on a study entitled **"LEVEL OF TECHNOLOGY INTEGRATION KNOWLEDGE OF TEACHERS IN RURAL ELEMENTARY SCHOOLS"** in partial fulfillment for the degree of MASTERS OF EDUCATION major in EDUCATIONAL MANAGEMENT.

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Your favorable response on this request will be highly appreciated. Thank you very much and God bless.

Sincerely yours,

JOSE JESSIE G. SALOMA
Researcher

Noted:

LINDY C. LULAB, Ed.D.
Adviser

Approved:

HANZEL C. SALVA
Head Teacher
Balah Elem. School

October 12, 2020

SANDEE F. DOMINGO
Head Teacher III
Panipasan Elem. School
Marilog District, Davao City

Sir:

I am currently working on a study entitled **"LEVEL OF TECHNOLOGY INTEGRATION KNOWLEDGE OF TEACHERS IN RURAL ELEMENTARY SCHOOLS"** in partial fulfillment for the degree of MASTERS OF EDUCATION major in EDUCATIONAL MANAGEMENT.

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Sincerely yours,

JOSE JESSIE G. SALOMA
Researcher

Noted:

LINDY C. LULAB, Ed.D.
Adviser

Approved:

SANDEE F. DOMINGO
Head Teacher III
Panipasan Elem. School

LETTER OF PERMISSION TO SUMILOP ELEM. SCHOOL PRINCIPAL

October 12, 2020

BRIAN B. BANZON

Principal 1

Sumilop Elem. School Marilog District, Davao City

Sir:

The undersigned is currently working on a study entitled **"TEACHERS LEVEL OF TECHNOLOGY INTEGRATION KNOWLEDGE AND TECHNOLOGY INTEGRATION IN DIFFERENT**

LEARNING AREAS" in partial fulfillment for the degree of MASTERS OF EDUCATION major in EDUCATIONAL MANAGEMENT.

In line with this, the researcher would like to request permission from your good office to conduct data gathering within your school where the teachers are the respondents or participants in the mentioned study. Attached herewith is the letter of permission approved by the Schools Division Superintendent of Davao City.

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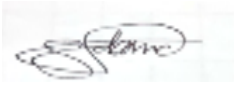
Sincerely yours,



JOSE JESSIE G. SALOMA Researcher

Noted:

LINDY C. LULAB, Ed.D. Adviser

Approved:

BRIAN B. BANZON Principal

Sumilop Elementary School