Teachers' Proficiency In Technological Pedagogical And Content Knowledge And Their Performance In Tagoloan District Schools

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Abstract : Teachers' proficiency in Technological Pedagogical and Content Knowledge and their performance played an important role in this study. Specifically, it sought to determine 1.) the respondents' level of proficiency on TPACK, 2.) the respondents' level of performance, and 3.) the significant relationship between the respondents' level of proficiency in technological pedagogical and content knowledge and their performance in Tagoloan District Schools during the School Year 2022-2023. A descriptive research design was used in the study to explore the teachers' proficiency among the two hundred (200) teacher respondents. The researcher used total population sampling, and an adapted questionnaire was employed as the main data-gathering tool in identifying and establishing the relationships between and among the variables. The researcher used statistical tools such as the percentage, frequency, mean and standard deviation, and Pearson Product Moment Correlation (r) to determine the significant relationship between proficiency on TPACK and teachers' performance. The findings of the study revealed the overall Teachers' Proficiency on TPACK was Moderately Proficient. It also showed that the level of teachers' performance aligned with PPST was High. Moreover, the level of proficiency and the performance of teachers has a significant positive correlation. It concluded that TPACK proficiency is essential for teachers to perform effectively and efficiently in school. Thus, training and seminars on technological pedagogical content knowledge may be implemented, and teachers may actively attend or participate in any professional development programs to improve their teaching performance that should align in all domains set by the Philippine Professional Standards for Teachers.

*Keywords***: Teachers' Proficiency, TPACK.**

I. INTRODUCTION

The lack of adequate professional development and training is the most frequently cited reason for not implementing technology in the classroom. Hence, the Department of Education (DepEd) included the expansion of professional development in technology as one of its policy recommendations. Unfortunately, despite DepEd's attempts to assist teachers in integrating technology into their instruction, many educators demonstrated resistance to change and the unwillingness to adopt the technology. The teachers sometimes struggled to complete teacher-related tasks. They had trouble delivering their work on time because they needed the necessary knowledge and a higher level of proficiency to incorporate technology into their teaching performance.

The Department of Education encouraged Filipino teachers to apply their knowledge to the teaching-learning process in public schools by using the Individual Performance Commitment Rating Form (IPCRF). According to DepEd Order 2, s. 2015 of the Civil Service Commission, as implemented by the Department of Education (DepEd), will be applied in accordance with the Department's Guidelines on the implementation and establishment of the Results-Based Performance Management System (RPMS). The policies outline the steps to take in setting objectives, keeping track of them, evaluating them, and planning future plans. The DepEd ensuring that work is focused on achieving its vision, mission, values, and strategic goals for offering Filipino students top-notch educational services by using the RPMS.

Teachers' proficiency in Technological, Pedagogical, and Content Knowledge (TPACK) is among the areas of interest concerning learners' academic performance on the premise that they can learn better if the teacher knows well on how to use or integrate technology in the teaching-learning process. While educational officials push for the use of technology in the teaching process, teachers have expressed a feeling of inadequacy in their ability to teach utilizing technology that teachers are generally seen as lacking the knowledge necessary to use technology in their classrooms successfully. These concerns may also be true among teachers in Tagoloan District with observing difficulty as being late in performing necessary teaching tasks like school forms submission and demonstration teaching that utilizes technology.

Notably, it has never been more crucial for schools to determine the level of TPACK proficiency among teachers and their performance due to the ongoing push to surpass goals. The researcher is one of the teachers in the Tagoloan district who would like to assess the teachers' degree of competence in educational theory, pedagogy, and topic knowledge in relation to their performance as teachers. The study's findings will serve as a benchmark for determining how teachers' self-efficacy on TPACK correlates with their teaching performance for effective classroom instruction.

Research on the efficient use of educational technology, particularly about teachers' performance and professional development, has been greatly influenced by the TPACK framework. TPACK is a term that is being used more frequently to define the knowledge that teachers

require in order to successfully incorporate technology into their teaching practices. The technological, pedagogical, and content knowledge role in creating technology integration activities for teachers' effectiveness has been investigated in a number of research. Researchers from ASCILITE, or the Australasian Society for Computers in Learning in Tertiary Education, discovered in one study that the TPACK framework improved teacher candidates' capacity to use technology in their learning and, subsequently, in their professions. To comprehend its advantages and disadvantages and how it can be used to grasp the knowledge and abilities required by teachers to use technology effectively in the classroom, researchers have also critically reviewed and analyzed the TPACK framework itself.

Furthermore, many technologies used in teaching became the focus of the increasing number of research looking at technology integration in schools. These studies show that the use of technology in conjunction with effective pedagogy has a positive impact on teachers' performance and accomplishment. However, findings from research studies are deemed insufficient for drawing conclusions about whether using technology improves teaching performance. Therefore, more extensive studies on TPACK need to be done. Additionally, despite promising study findings and the removal of external barriers, technology is still not utilized as frequently or to the required standard in teaching to support the improvement of the teachers' performance. There are currently very few ways that explicitly measure teacher performance, and existing TPACK measures have mainly centered on teachers' self-reports of their own understanding.

Moreover, the study has undertaken that teachers perform better when their claims of technological pedagogical topic understanding are more substantial. In connection with this, when the teachers' level of proficiency on TPACK is increased, the higher the level of teachers' performance in terms of effectiveness and efficacy. At the same time, if the teachers are equipped with professional technical knowledge and skills in their classroom instruction, it will also strike a significance on the learner's motivation and engagement. It will lift the student's academic performance and competency to improve. Furthermore, if teachers are more involved in interacting and working online via audio, video conferencing, and electronic groups, learners are more likely to be skilled in executing the task involving online video conferencing. On the other hand, one cannot give what he/she does not have. In the same manner, a teacher cannot impart knowledge that they do not possess.

I.   RESEARCH METHODOLOGY

This study used the descriptive survey method because it provides a sufficient and accurate interpretation of the data, sometimes with little or no help from statistical methods. Descriptive research is a deliberate process of gathering, analyzing, categorizing, and tabulating data about current conditions, practices, trends, and cause-and-effect relationships . Additionally, by establishing the facts about the group under study, this method produces results that can describe the group's general characteristics in qualitative, quantitative, or both ways.

The descriptive-correlational method of research is best suited for this study since this seeks to explain the links between two or more variables. Research investigations that seek to present static images of circumstances and determine the link between various factors employ descriptive correlational design.

3.1 Population and Sample

The participants of this study were two hundred (200) teachers from ten (10) public elementary schools in Tagoloan District. Division of Misamis Oriental for the School Year 2022-2023. The researcher used total population sampling, where all the members of the population were involved. The distribution of respondents by the 10 schools

3.2 Data and Sources of Data

The instrument used in gathering the necessary data is a questionnaire composed of two parts. Part I deals with determining the teacher's proficiency in TPACK components. This is an adopted questionnaire from in their study "Exploring relationships among TPACK components and development of the TPACK instrument." On the other hand, Part II was the Self-assessment questionnaire based on DepEd's IPCRF with PPST (Philippine Professional Standards for Teachers) .

3.3 Theoretical framework

This study is anchored on the TPACK framework introduced at Michigan State University by Mishra and Matthew J. Koehler in 2006 [11]. TPACK is a theory that was developed to explain the set of knowledge the teachers need in order to teach their students a subject, teach effectively, and use technology. TPACK is a framework for technology integration that identifies the technical, pedagogical, and content expertise that teachers must combine for successful edtech integration. It extends Shulman's idea of Pedagogical Content Knowledge to develop a framework that enables teachers to more effectively incorporate technology into their lessons.

A strategy based on TPACK goes beyond technocentric tactics and highlights the necessity of aiding teachers in developing and using integrated and interdependent understandings of technology, pedagogy, content, and context. Furthermore, the TPACK framework emphasizes the knowledge types that reside at the intersections of the three main forms: Technological Content Knowledge (TCK), Pedagogical Content Knowledge (PCK), Technological Pedagogical Knowledge (TPK), and Technological Pedagogical Content Knowledge (TPACK) .

This study will examine the relationship between proficiency on TPACK and teachers' performance. It is believed that proficiency may contribute to teachers' performance. The proficiency and application of TPACK must be considered in its wider context because educators need specific professional knowledge to use and integrate digital technology. Teachers will understand how their teaching performance is impacted by how students learn using digital tools.

In this study, it is hypothesized that teachers will perform better the more highly their technology pedagogical topic understanding is assessed. In connection with this, when the teachers' level of proficiency on TPACK is increased, the higher the level of teachers' performance in terms of effectiveness and efficacy. At the same time, if the teachers are equipped with professional technical knowledge and skills in their classroom instruction, it will also strike a significance on the learner's motivation and engagement. It will lift the student's academic performance and competency to improve. Furthermore, suppose teachers are more involved in interacting and working online via audio, video conferencing, and electronic groups. In that case, learners are more likely to be skilled in executing tasks involving online video conferencing. On the other hand, one cannot give what they do not possess. Similarly, a teacher cannot teach what he/she does not know.

This study aimed to determine the proficiency level in Technological Pedagogical and Content Knowledge (TPACK) and teachers' performance in Tagoloan District schools of Misamis Oriental during the school year 2022-2023. Specifically, this study sought to answer the following research questions:

1. What is the respondents' level of proficiency on TPACK in terms of: a. Technological Knowledge; b. Pedagogical Knowledge; c. Content Knowledge; d. Pedagogical Content Knowledge; e. Technological Content Knowledge; f. Technological Pedagogical Knowledge; and g. Technological Pedagogical Content Knowledge?

2. What is the respondents' level of performance in the following domains: a. Content Knowledge and Pedagogy; b. Learning Environment; c. Diversity of Learners, Curriculum Planning and Assessment, and Reporting; and d. Community Linkages and Professional Engagement and Professional Growth and Development?

3. Is there a significant relationship between the respondents' level of proficiency in Technological Pedagogical and Content Knowledge (TPACK) and their performance?

3.4 Statistical tools and econometric models

After collecting and recording the data gathered in this study, the researcher used the following statistical tools: Descriptive statistics such as percentage, frequency, mean, standard deviation, and Pearson Product Moment Correlation (r) were used to describe the variables in the study. Problems 1 and 2 used the mean and standard deviation to determine the level of teachers' proficiency on TPACK and performance. While Problem 3, the Pearson Product Moment Correlation (r) was utilized to determine the significant relationship between proficiency on TPACK and teachers' performance (PPST).

3.4.1 Descriptive Statistics

This study used the descriptive survey method because it provides a sufficient and accurate interpretation of the data, sometimes with little or no help from statistical methods. Descriptive research is a deliberate process of gathering, analyzing, categorizing, and tabulating data about current conditions, practices, trends, and cause-and-effect relationships . Additionally, by establishing the facts about the group under study, this method produces results that can describe the group's general characteristics in qualitative, quantitative, or both ways.

The descriptive-correlational method of research is best suited for this study since this seeks to explain the links between two or more variables. Research investigations that seek to present static images of circumstances and determine the link between various factors employ descriptive correlational design.

IV. RESULTS AND DISCUSSION

4.1 Table 1: Teacher-Respondents' Level of Proficiency

Variables	Mean	SD	Description
Technological Knowledge	2.96	0.59	Moderately Proficient
Content Knowledge	3.11	0.53	Moderately
Pedagogical	3.15	0.60	Moderately
Pedagogical Content	3.08	0.54	Moderately
Technological	3.08	0.60	Moderately
Technological-	3.10	0.58	Moderately
Technological Content	3.08	0.60	Moderately
Technological-	3.05	0.57	Moderately
Overall	3.08	0.58	Moderately

Table 1 reflects the Teacher-Respondents' Level of Proficiency with an overall mean of 3.08 (SD=0.60), described as Moderately Proficient. This means that teachers are moderately proficient in their technological, pedagogical, and content knowledge or the totality of unified knowledge, which is one of the main components of educational technology. Many fields of education can benefit from educational technology, and it has become more crucial to use technology in accordance with content and pedagogy . Hence, TPACK enables teachers to use appropriate techniques and methods to integrate technology in the classroom for successful learning and teaching process.

Particularly, Pedagogical Knowledge got the highest mean rating of 3.15 (SD=0.60), described as Moderately Proficient. This means that pedagogical knowledge is found to be the most important proficiency in Technological Pedagogical and Content Knowledge. This signifies that the teachers are utilizing Pedagogical Knowledge to provide useful feedback that improves student learning. In addition, teachers need to be pedagogically savvy to successfully use data to improve student outcomes, to successfully modify and alter education by planning, adjusting, or adapting as needed to meet the requirements of particular students as well as to provide constructive criticism which increases student learning.

On the other hand, Technological Knowledge got the lowest mean rating of 3.08 (SD=0.54), described as Moderately Proficient. This means that not all teachers utilize technological knowledge to teach lessons in their classes. Not all teachers prefer technology-based pedagogy, which employs digital or electronic tools, media, and resources to teach specific courses. On the contrary, teachers should have the necessary information and be competent in utilizing technology because teachers' technological knowledge and skills have a significant impact on their use of technology in the teaching and learning process.

Table 2: Distribution of Respondents' Level of Performance

Indicators	Mean	SD	Description
Content Knowledge and Pedagogy	3.07	0.54	High
Learning Environment	3.14	0.59	High
Diversity of Learners, Curriculum Planning	3.07	0.57	High
Community Linkages and Professional	3.12	0.69	High
Overall	3.1	0.60	High

Table 2 shows the distribution of respondents' level of performance with an overall mean of 3.1 (SD=0.60), described as High. Based on the findings, Learning Environment got the highest mean rating of 3.14 (SD=0.59), described as High. A learning environment is the total surroundings in which students interact in order to enrich their experiences and thereby learn. Thus, obtaining maximum outcomes in student learning is to create a good learning environment in the classroom.

Further, Content Knowledge and Pedagogy got the lowest mean rating of 3.107 (SD=0.54), described as High. Although the findings revealed

that the mean score is the lowest among all items, high description still means that most teachers are still able to establish content knowledge and pedagogy for their students. Content Knowledge and Pedagogy include the ability of teachers to implement meaningful teaching that is developmentally appropriate and based on current research and subject-matter expertise.

On the other hand, Table 3 (as shown on page 5) presents the Correlation Coefficients (r) and Significance (p) of Teachers' Proficiency in Technological, Pedagogical and Content Knowledge and Teachers' Performance. The result of correlation analysis revealed that the overall TPACK proficiency is significantly correlated to the overall teachers' performance (r=0.774, p<0.01). The p-value signifies that the interrelationship of the categories for TPACK to the categories for teachers' performance have significant positive correlations. This suggests that when the teacher has professional knowledge in technology, pedagogy, and content, he/she performs well in teaching, especially in terms of the PPST domains. TPACK enhances teachers' skills in teaching and learning process, promoting learners' welfare, and classroom management. This knowledge is also adding importance to the wider community of teachers that promote collaboration and social values. Most importantly, TPACK boost teachers understanding about technological changes, and how to adapt to these changes to become more effective in teaching and to grow professionally.

Many complex events may be evaluated and explained within the framework of TPACK, which is widely considered as an excellent analytical tool for enhancing teaching, and it increases teacher awareness of the need to combine their understanding of content, pedagogy, and technology. This indicates that TPACK is crucial to teachers' performance because it enables them to evaluate and reflect on their work for the sake of their competence and professional development .

In terms of overall proficiency in technological pedagogical content knowledge, it has the highest correlation between content knowledge and pedagogy (r=0.745, p<0.01). This means that when a teacher is high in technological pedagogical content knowledge, he also performs well in the first domain of PPST or the content knowledge and pedagogy. To create a variety of knowledge bases, skills, and competencies, teachers need to be well-versed in both content and pedagogy. Effective teachers are conscious of the importance of possessing a solid understanding of both the subjects they will teach, and the pedagogical methods needed in the teaching profession. On the other hand, the learning environment aspect is not substantially correlated with the total TPACK proficiency of teachers (r=0.652, p 0.01) [19]. It indicates that a teacher's level of TPACK expertise has no bearing on how he or she builds a secure and supportive learning environment for the students. Teacher's commitment lays the groundwork for creating safe and favorable environments for learning. This implies that it is the duty of a dedicated teacher to create a secure and supportive learning environment.

Moreover, in terms of teachers' overall performance, it has the highest correlation on the pedagogical content knowledge (r=0.713, p<0.01) [20]. This means that when a teacher has a high level of pedagogical content knowledge, he/she also performs well in teaching. The ability to organize specific topics for learners by fusing content and pedagogy is known as pedagogical content knowledge [21]. This knowledge covers topics like how learners learn, how to assist effective learning, and how to combine material and pedagogy. It also includes comprehending what is to be taught, learned, and assessed. Thus, developing pedagogical subject knowledge can improve educators' effectiveness and success.

However, the overall performance of teachers has the lowest correlation to the technological knowledge aspect (r=0.400, p<0.01). It is an indication that regardless of how low or high the level of technological knowledge a teacher has, he/she can still be able to perform well in her teaching. As observed, there are a lot of factors that contribute to teachers' performance. Teachers that possess technological expertise can employ technology to promote productivity, apply practical digital tools to broaden students' learning opportunities and boost student support and engagement. Yet not every educational problem can be resolved by technology. There is not a single technical solution that works for all teachers, all subjects, or all teaching philosophies. Considering that a lot of teachers find the process of integrating technology in the classroom to be complicated and different [22].

The outcomes of this research have provided insights into the teachers' proficiency in technological, pedagogical, and content knowledge and their performance in Tagoloan District schools. Overall, the TPACK proficiency of teachers is significantly correlated to their performance. TPACK proficiency allows teachers to be more effective and competent in the teaching and learning process. It also enables teachers to utilize ICT as part of 21st Century skills. Thus, the result of this study emphasizes the importance of different types of knowledge in relation to teachers' duties, responsibilities, and performance in school. However, the results should be interpreted with caution due to the limitations of the current research.

Acknowledgment

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