

TEACHING PERFORMANCE OF SCIENCE TEACHERS IN THE NEW NORMAL AND THEIR TECHNOLOGICAL PEDAGOGICAL AND CONTENT KNOWLEDGE (TPACK) SELF-EFFICACY

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Abstract: This study investigated the teaching performance of Science teachers in the new normal and their TPACK self-efficacy. Descriptive research design was used. Teachers' performance was assessed using the Philippine Professional Standards for Teachers (PPST) criteria while TPACK self-efficacy was assessed using adopted questionnaires. Three hundred and eighty six (386) Science teachers participated and their responses were analyzed using descriptive designs

Results of the study revealed that Science teachers have a very satisfactory teaching performance with high level of TPACK self-efficacy. Therefore, the more aware teachers are with regard to TPACK self-efficacy, the higher the quality of education they can provide.

Keywords: teachers' performance, TPACK self-efficacy, and new normal

1. INTRODUCTION

The tasks teachers must complete in the classroom might range from the easy to the complex, but they are all crucial and engaging. They consistently make an effort to attend their assignments so they may fulfill the duties placed on them as part of their commitment to their chosen career path. These factors call for educators to have a solid grasp and command of the topics they instruct, to be informed about the guiding principles and practices of instruction, and to be skilled users of technological tools for instruction and assessment.

Technology has a noticeable impact on practically everything we do, and its influence on learning and education is only expanding. Today, there is a pressing and ongoing need to incorporate technology into the educational process, especially given that students of this generation are dependent on its use (Aquino, 2015). Technological Pedagogical and Content Knowledge (TPACK) is a term used to explain how technology is used in the classroom. Teachers must have the skill of integrating technology into the curriculum for creative and current teaching because it has permeated practically every part of our lives.

With all of the available efforts to provide the software and hardware for technology integration, it is sad to note that not all of the teachers were provided with lasting training. As of 2016, the Philippine Statistics Authority reported that 89 percent of primary schools had electric power and 78 percent had computers, but just 26% had internet access. For the secondary schools, 93 percent had electricity and 83 percent had computers but just 43 % had internet access (San Buenaventura, 2019).

Today, the details on the specific characteristics of teachers in relation to their teaching performance and TPACK self-efficacy have not been examined well during the surge of the pandemic. As of to date, there are yet limited studies tackling the data of Filipino Science teachers' teaching performance and their TPACK self-efficacy. The purpose of this study is to gather data and information on the teaching performance and TPACK self-efficacy of

science teachers in order to support professional development initiatives and identify areas where teachers' professional requirements could be addressed.

2. MATERIALS AND METHODS

Over-all, a total of three hundred and eighty-six (386) teachers participated in the study. The participants were chosen through total sampling procedure. This includes all secondary Science teachers who are graduates of either Bachelor of Science in Secondary Education specializing in Biology, Chemistry, General Science, Physical Science and Biological Science or those teachers who are non-education graduates but have taken professional education courses whose baccalaureate degrees are science related.

This study made use of descriptive design to determine the level of teachers' teaching performance and TPACK self-efficacy. The research instrument is composed of two (2) parts. Part I dealt with the teachers' teaching performance using the Philippine Professional Standards for Teachers (PPST) of the Department of Education as per DepEd Order No. 42, s. 2017. Part II is the TPACK Self-efficacy adopted from Hosseini & Kamal (2012).

The following rating scale was used to better understand the data:

TPACK Self-Efficacy				Teachers' Performance		
Rating	Scale	Descriptive Rating	Qualitative Interpretation	Scale	Range	Qualitative Interpretation
5	4.51 – 5.00	Strongly agree	Very High level of TPACK self-efficacy	5	4.51 – 5.00	Outstanding (O)
4	3.51 – 4.50	Agree	High level of TPACK self-efficacy	4	3.51 – 4.50	Very Satisfactory (VS)
3	2.51 – 3.50	Undecided	Moderate level of TPACK self-efficacy	3	2.51 – 3.50	Satisfactory (S)
2	1.51 – 2.50	Disagree	Low level of TPACK self-efficacy	2	1.51 – 2.50	Fair (F)
1	1.00 – 1.50	Strongly disagree	Very Low level of TPACK self-efficacy	1	1.00 – 1.50	Needs Improvement (NI)

3. RESULTS AND DISCUSSION

3.1 Teachers' Teaching Performance

Table 1 displays the variables of teachers' performance. The overall mean of teachers' performance on learning environment is 3.78; on diversity of learners 3.78; on assessment and reporting 3.75; on content knowledge and pedagogy 3.75; and curriculum and planning 3.72. The average mean of the teachers' performance is 3.76 which corresponds to "Very Satisfactory".

Table 1. Level Science teachers' Performance

Teachers' Performance Indicators	Mean	Qualitative Interpretation
Learning Environment	3.78	Very Satisfactory (VS)
Diversity of Learners	3.78	Very Satisfactory (VS)
Assessment and Reporting	3.75	Very Satisfactory (VS)
Content Knowledge and Pedagogy	3.75	Very Satisfactory (VS)
Curriculum and Planning	3.72	Very Satisfactory (VS)
OVERALL MEAN	3.76	Very Satisfactory (VS)

This study expresses that the Junior High School (JHS) and Senior High School (SHS) science teachers have a very satisfactory teaching performance. They have been highlighting all of the necessary skills for them to be able to deliver the quality education deserve by Filipino learners in spite of the challenges brought upon by the pandemic. With the performance that teachers have showed in the study, it can basically create an idea that learners will also be able to show a significantly high level of academic performance since teachers are considered as the most important school-related factor that influence students' achievement (Cheng & Xie, 2018). In the foundation of the ideas in the Theory of Performance by Elger (2007), this study also shows that performance of teachers could really be improved provided that they have the proper support and an environment that is uplifting. Secondary Science teachers in the three divisions can then be able to make use of this realization in securing the respective indicators of their performance to be of prime importance from the crafting of their needs assessments to the implementations of the program they are part of.

3.2 Technological Pedagogical and Content Knowledge (TPACK) Self-Efficacy of Secondary Science Teachers

Table 2 displays the respective knowledge domains of the TPACK Self-efficacy. A grand mean of 4.23 was obtained from the study which has a qualitative interpretation of "High level of Self-Efficacy" in the overall assessment of TPACK Self-efficacy among the JHS and SHS teachers of the Divisions of Bukidnon, Malaybalay City and Valencia City. Likewise "High level" was also obtained among all of the seven (7) knowledge domains: TCK has the highest mean score of 4.30; followed by CK (4.27); PK (4.25); TPK (4.23); PCK (4.22); TPACK (4.21), and TK has the lowest mean score of 4.15. The data help us understand that at the present challenges of the overwhelming pandemic, teachers showed higher level of self-efficacy on TCK suggesting that teachers are more into relating themselves with the necessary technologies coupled with their mastery of the content in their respective fields of expertise.

Table 2 Science teachers' level of TPACK self-efficacy

TPACK Self-Efficacy Indicators	Mean	Descriptive Rating	Qualitative Interpretation
Technological Content Knowledge	4.30	Agree	High level of Self-Efficacy
Content Knowledge	4.27	Agree	High level of Self-Efficacy
Pedagogical Knowledge	4.25	Agree	High level of Self-Efficacy
Technological Pedagogical Knowledge	4.23	Agree	High level of Self-Efficacy
Pedagogical Content Knowledge	4.22	Agree	High level of Self-Efficacy
Technological Pedagogical and Content Knowledge	4.21	Agree	High level of Self-Efficacy
Technological Knowledge	4.15	Agree	High level of Self-Efficacy
OVERALL MEAN	4.23	Agree	High level of Self-Efficacy

In the light of the study, it has been found that teachers having high level of self-efficacy in pedagogy are far more confident in the technological integration (Hosseini & Kamal, 2012) in the refinement of their knowledge in the content and pedagogy. Teachers' technological content knowledge is at the heart of effective teaching as far as the study is concerned. Educators must overcome certain traditional professional learning practices if increase in the quality of teaching and learning desired. Additionally, educators value and expand their perspectives of being specialists who use technology to enhance subject matter teaching skills which is greatly supported by the foundations of TPACK by Mishra and Koehler (2006). They are also committed to high-quality professional development aimed at furthering their knowledge. Similar to the result of this study, Ertmer and Ottenbeit-Leftwich (2010) assert that there is a strong cohesiveness between that of technology blended with Content Knowledge domain. In Semiz and Ince (2012) study, it was also discovered that maintaining a learning environment that is integrated with technology makes instruction more effective and permanent. According to Celik et al. (2014), however, the process of integrating technology into education creates severe pedagogical issues for instructors and the learning environment. The majority of these issues arise from the lack of adequate and suitable pedagogical approaches to teaching using technology (Bass, 2015).

4. CONCLUSIONS AND RECOMMENDATIONS

Based on the above findings, the conclusions were drawn as follow:

The Science teachers of the divisions of Bukidnon, Malaybalay City and Valencia City, Phils. have a very satisfactory teaching performance measured in terms of learning environment, diversity of learners, assessment and reporting, content knowledge and pedagogy, and curriculum and planning. The TPACK self-efficacy of the Science teachers was of “High level” which translated that they have strong agreement that all of the knowledge domains in the TPACK self-efficacy are necessary in their teaching.

The overall result revealed that teachers could deliver higher-quality instruction when they were more conscious of their TPACK self-efficacy. Science teachers should think about expanding their technical knowledge and abilities in order to improve their teaching effectiveness, which will have a significant impact on their multifaceted role as knowledge inculcators.

As per the study's findings, the secondary public science teachers in the three (3) DepEd districts in the province of Bukidnon, the Philippines are encouraged to make use of online trainings and seminars on how to become more effective in their understanding of TPACK, particularly that of integrating technology into their own areas of competence among the various branches of Science. To increase teachers' effectiveness in educating students in all of the TPACK knowledge domains, trainings and seminars in the planning, developing, and implementation of effective online learning environments may be provided.

The development of teachers' abilities to impart technological skills development to students may also be emphasized during teacher training sessions like In-service Training (INSET) and Learning Action Cell (LAC) sessions. Teachers may also receive workshops on how to identify the abilities that need to be developed in students so that they may identify the best methods for incorporating the skill in development assignments.

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